...GICAL ROOM
...AL LIBRARY
...Y. OF MICH.

STEEL

For forty-eight years—IRON TRADE REVIEW

March 5, 1931

APR 5 1931

The Titanium Alloy Manufacturing Co.

Niagara Falls, N. Y., U. S. A.

BRANCH OFFICES

60 John Street, New York
Oliver Building, Pittsburgh
Keith Building, Cleveland

FERRO CARBON TITANIUM
REG. U.S. PAT. OFFICE TRADE MARK
F.C.T.

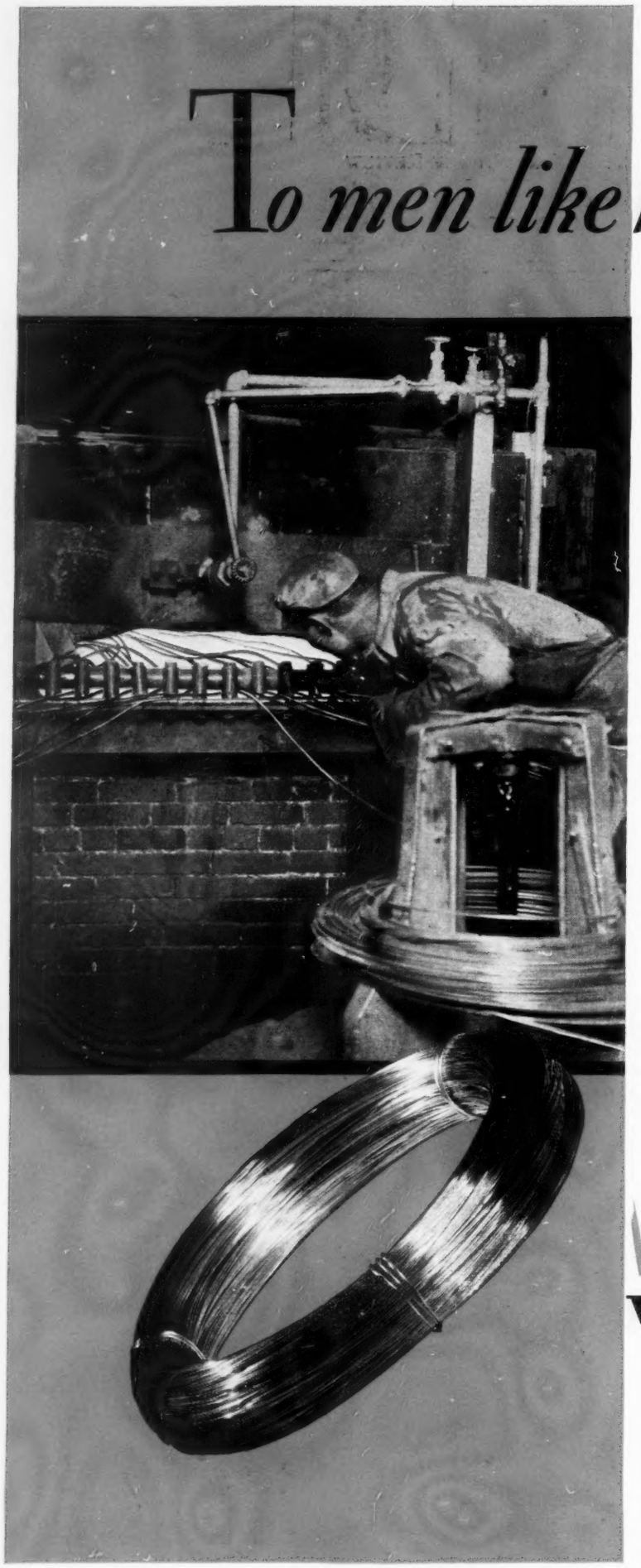
AGENCIES

PACIFIC COAST

Balfour, Guthrie & Co., San Francisco, Los Angeles, Portland, Seattle, Tacoma Vancouver, B. C.

GREAT BRITAIN AND EUROPE

T. Rowlands & Co., Ltd., Sheffield, Eng.



To men like him GOOD WIRE is religion

EVEN though all our furnaces are automatically controlled by recording pyrometers, these men, many of them trained as boys in our plants by their own fathers and in some cases their grandfathers, still feel the same old satisfaction at seeing wire "take the color". Their faithful following of scientifically planned instructions and skillful handling of work in process all contribute to the quality and uniformity of Wissco Wire.

•

Wickwire Spencer Steel Co.
41 East 42nd Street, New York City

Buffalo Chicago Detroit Cleveland
Philadelphia Tulsa Worcester

Pacific Coast Headquarters: San Francisco
Branches and Warehouses: Los Angeles, Portland, Seattle

WISSCO
WICKWIRE SPENCER
WIRE

Wickwire Spencer manufacturers High and Low Carbon Wires —in various grades and finishes—for your specific purpose... Hard Drawn and Oil Tempered Spring Wire, Armature Binding, Book Binding, Broom, Brush, Card, Clip, Flat and Strip Steel, Florist, Hairpin, Hook and Eye, Rope, Pin, Mattress, Music, Stapling, Shaped, Tire, Clock, Pinion, Valve Spring and Welding Wires. Consult the Wissco technical man on your wire problem, however large or small.

Vol. 88, No. 10, Mar. 5, 1931, issue of STEEL, published weekly at Cleveland, O. Entered as second class matter at the post office, Cleveland, O., under the act of March 3, 1879. Subscription $6 a year in U. S. and Canada; foreign £2:0:0; single copies, 25c.

STEEL

PRODUCTION

PROCESSING

DISTRIBUTION

USE

EDITORIAL STAFF

E. L. SHANER
EDITOR

ASSOCIATE EDITORS

E. C. BARRINGER — E. F. ROSS
A. J. HAIN — J. D. KNOX
G. H. MANLOVE — W. H. LLOYD
GUY HUBBARD

New York
E. C. KREUTZBERG — B. K. PRICE
H. R. SIMONDS

Pittsburgh — W. G. GUDE
Chicago — F. B. PLETCHER
Washington — L. M. LAMM
London — VINCENT DELPORT

ADVERTISING STAFF

G. O. HAYS
BUSINESS MANAGER

New York
J. F. AHRENS — E. W. KREUTZBERG

Pittsburgh
S. H. JASPER — C. B. HUMPHREY

Chicago
L. C. PELOTT — C. A. WARDLEY

Cleveland
JOHN HENRY — R. C. JAENKE

F. F. LIGHT, *Circulation Manager*

CONTENTS

March 5, 1931

THIS WEEK IN STEEL 21

Five-Year Stabilization Plan for Scrap Industry 23
50,000,000 Tons of Scrap Consumed in 1929 23
Ohio Foundrymen Discuss Problems 25
February Pig Iron Rate Up 19.5 Per Cent 27
January Exports Off 9 Per Cent; Imports Steady 29

Industrial Men in the Day's News 30
Obituary 31
Here and There in Industry 32
Mirrors of Motordom 33

EDITORIAL—Scrap, an International Factor 34
THE BUSINESS TREND 35

Magnetic Testing of Pipe Welds Is New Inspection Method.... 39
Metropolitan New York Largest Shape User Last Half 1930.... 44
Strip Tempers Modified by Rolling After Annealing 50
Steelmakers Will Benefit from Open-Hearth Research 55
Moisture in Gas Has Effect on Carburizing Action..... 59
Large Uses of Steel in Small Ways—Multigraphs 62
Various Factors Affect Growth of Gray Cast Iron 63
Scanning the Technology of Steel 65
Machine Tools and Plant Equipment 68

MARKET SUMMARY 81
MARKET REPORTS AND PRICES 82-112
CONSTRUCTION AND ENTERPRISE 118
NEW TRADE PUBLICATIONS 122
WHERE-TO-BUY DEPARTMENT 125
ADVERTISER'S INDEX 160

STEEL is published every Thursday by PENTON PUBLISHING CO., Penton Building, Cleveland, O. C. J. STARK, President; J. D. PEASE, Vice President; F. V. COLE, Secretary. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association. Branch Offices: New York, 220 Broadway; Chicago, Peoples Gas building; Pittsburgh, Oliver building; San Francisco, Alto building; Washington, National Press building; Cincinnati, Schmidt building; London, Caxton House, Westminster, S. W. 1.; Paris, 9 Rue de Londres; Berlin, Dahlmerstrasse 64 A, Lichterfeld-West. Subscription in the United States, Canada, Cuba and Mexico $6 per year; in Great Britain and European countries £2:0:0.

Entered as second class matter at post office at Cleveland under the Act of March 3, 1879.

Copyright 1931 by the Penton Publishing Co.

Dozens and dozens of different special steels and more being developed all the time. What will they do? We can tell you—and give you chemical and manufacturing data, and in addition we will be glad to demonstrate those that may have a practical bearing on your steel requirements.

The Ryerson Journal shows weights, strengths, standard sizes etc. on most of these steels. Keep it handy—it is one of your most complete steel guides. And when you are checking through it, remember that we will be glad to send you free samples for testing.

Joseph T. Ryerson & Son, Inc. Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City

RYERSON

S.A.E. Alloy Steels Hot Rolled S.A.E. 2315, 2320, 2330, 2335, 2340, 2345, 2350, 3115, 3120, 3135, 3140; also Cold Drawn S.A.E. alloys.

Allegheny Metal —The unstaining, unrusting, unter-nishing nickel chrome alloy. Large and complete stocks

Heat Treated Alloy Steel Various grades of alloy steel bars heat treated and ready for use, in a wide range of sizes.

Tool Steels Special grades of tool steel for every shop requirement. Also tool steel sheets, tool holder bits, etc.

Reinforcing Bars and Accessories Bars cut, bent and delivered as needed, including all accessories.

1842 · · · The Eighty-eighth Year of Ryerson Steel-Service · · · 1931

Chain, Grab Hooks, Etc. Standard grades and sizes of chain; special chain for cranes and steam shovels; grab hooks, etc.

Boiler Tubes and Fittings Boiler tubes, ferrules, flanges, hangers, lugs, crabs, hand holes, braces, nozzles, patch bolts, etc.

Welding Rod and Equipment Special rods adapted to welding the various materials and also all types of equipment.

Rivets, Bolts, Nuts, Washers, Etc. The range of kinds and sizes carried are too numerous to list.

Babbitt Metal and Solder Five grades of Glyco Babbitt meet all requirements. "Ryerson Guaranteed" solder is also stocked.

Volume 88 Number 10

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

AS GOES March so goes the remainder of the year, business executives increasingly are saying. Producers of steel believe that if they can continue the January and February improvement in the markets into this month they can count on ascending activity until midsummer. Automobile executives at Detroit, having stocked dealers' showrooms out of January and February production, look to March to disclose whether the country is in a buying mood. If building develops a tendency to go forward this month it seems probable that many who are now on the fence with their building projects will be encouraged. A substantial gain in car loadings may release some railroad equipment orders.

Business has not been in the March test tube sufficiently long to develop a reaction, but for steel it opens auspiciously. True, sentiment is slightly diluted this week, largely because the stock market has failed to hold its recent highs, but the more trustworthy indicators of production and demand are favorable. Steelworks operations have climbed to 55 per cent this week (Page 85), with Chicago and Cleveland rates up six points. February's increase of 19.5 per cent in the daily rate of pig iron production (Page 27) and the net gain of seven in active blast furnace stacks are heartening. The likelihood of a general steel price advance (Page 81), even though it only firms present levels, is an omen. Certainly the first week of March augurs well.

Congress Dies—Also 16,000 Bills

Sixteen thousand lives were lost at Washington Wednesday noon, with few mourners and no one accounting it a major catastrophe. They were the lives, of course, of bills and resolutions which were snuffed out automatically when the short session of congress adjourned sine die and sine regret. Save for the ministrations of the tariff and trade commissions, business is not likely to encounter serious governmental obstruction until next December. . . Among the measures which perished were the various proposals (Page 26) to embargo Russian imports. . . . The tariff commission may take the spotlight shortly with a report (Page 28) of its findings on pig iron, with an increase in the duty of $1.12½ per ton possible.

Ford and Chevrolet Fender to Fender

After taking Chevrolet's dust for several months, Henry Ford is passing his chief rival in production this week (Page 33), the count being 18,000 units to 15,000. As if to widen the gap, some types of Ford bodies will shortly be several inches wider and longer. Increased Ford activity, it is believed at Detroit, fore-

Wide World Photo

Corner windows in skyscrapers have been made possible by a centilever construction just devised. This building on West street, New York, is an example of this type, which gives a wider view

shadows a generally-quickened automobile market. . . . Only Ford could be constructive in a destructive manner. To Feb. 23 he had junked 49,089 derelicts at Fordson (Page 117), netting his open-hearth steel furnaces 21,500 tons of scrap, among other things.

Iron Ore Market of 1931 Is Opened

Not only is Ford first in building and in scrapping automobiles, but he also is first as usual in the iron ore market. For his two blast furnaces Ford is inquiring (Page 96) for 290,000 tons of Lake Superior ore, 40,000 tons less than a year ago due chiefly to the increased output of his own mines. Chances are last year's ore prices will be continued. . . . Ammunition for those who believe iron ore will eventually be practically supplanted by scrap is provided by the government census report showing (Page 23) that in 1929 the consumption of scrap was 50,000,000 gross tons while that of pig iron—into whose manufacture some scrap went—was only 41,000,000 tons. . . . It is the iron ore resources of Youngstown Sheet & Tube which form one of its attractions for Bethlehem Steel. The hearing of the appeal in their merger action is now set (Page 25) for March 19.

Over Third of Structurals to New York

Even in building Ford is first, an analysis of structural steel awards in the last half of 1930 disclosing (Page 44) that his new branch plants constituted the major industrial construction activity of that period. New York again led in point of tonnage, consuming 38.5 per cent of all structural steel placed. . . . Building, it will be recalled, took first place in 1930 in the consumption of steel, perhaps because structural material was reasonably priced. Charting typical steel and iron prices with principal items in the cost of living reveals (Page 25) that it is relatively lower than rent and food. . . . Of seven "keys" to success (Page 24) the first is to wrest a profit from every undertaking, and the fourth is to advertise. . . . Wages based upon market prices are beginning to feel competitive levels, union sheet and tin mill workers taking a cut (Page 24) of 3 per cent for March and April.

Versatility vs. Specialization

In the machine tool world, versatility is challenging the long reign of specialization. With sweeping changes in design occurring frequently in metal products manufactured on a production basis, the economic value of costly, inflexible machines is moot. Hence, manufacturers of standard machine tools are "building versatility" into their product, markedly reducing (Page 68) the hazard of equipment investment. . . . This adaptability is one by-product of research, which an electrical manufacturer told Pittsburgh engineers recently (Page 28) should be pursued by every industry. . . . Such research also has facilitated the testing of pipe line wells. A combination of magnetic testing and X-ray examination has been found (Page 39) to indicate the character of the weld examined and to disclose any voids, gas pockets, blow holes, burnt metal or weak structures.

Now Scrap Has 5-Year Program

Next week's convention of the Institute of Scrap Iron and Steel Inc. at Cleveland will emphasize that the scrap industry has grown to major proportions, that the scrap dealer of today is not to be confused with the "junkie." For one thing, the convention will outline (Page 23) a 5-year stabilization program, designed primarily to broaden the utilization of scrap iron and steel and conserve the nation's resources of iron ore. . . . Even foreign chancelleries are attentive when scrap is mentioned, for its possession is substantially as great a national resource as deposits of iron ore. Proud, militant Italy is not above using her foreign office (Page 34) to insure supplies of scrap from other countries. The Argentine has gone so far as to prohibit the exportation of scrap. Steel has only begun its development, declared two structural steel authorities (Page 23) at Denver recently. . . . Russia is seen (Page 23) as a buyer, not a seller of steel and iron.

Graphite, Heat Make Gray Iron «Grow»

"Growth" of certain kinds of gray iron castings under repeated heating and cooling, long a subject of research, is attributed to the precipitation and oxidation of graphite and mechanical swelling by a speaker (Page 63) at the meeting of the American Institute of Mining and Metallurgical Engineers in New York—another score for research. . . . At the Western Metal congress in San Francisco the other week it was claimed (Page 55) that deoxidizing heats of steel with manganese-silicon alloy produces cleaner steel than other deoxidizing methods. . . . At the same congress an authority contended (Page 59) that the variable moisture content of carburizing gas affects the carbon penetration. By drying gas and then dripping the required amount of moisture into it improved carburizing action is claimed.

Consult Chart for Strip Steel Needs

Definite information as to the physical characteristics of all tempers of cold-rolled strip steel frequently assists the purchaser in specifying the most suitable stock. A comparison of physical values as disclosed by various types of testing machines (Page 50) may serve as a guide.

Five-Year Stabilization Plan Aim of Scrap Industry

A FIVE year stabilization program for the steel and iron scrap industry will be proposed by Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, at the third annual convention of the institute, at Cleveland, March 10-12. Wider uses of scrap, more efficient distribution and greater conservation of iron ore and other natural resources, resulting from the use of scrap, will be the objective sought in the proposed program.

The convention will be featured by 12 speakers and authorities on various phases of the business. In addition to Mr. Schwartz, the speakers will include Judge Carl D. Friebolin, court of common pleas, Cleveland, who will be toastmaster at the annual banquet; Rabbi Barnett Brickner, who will discuss "Can a Business Man Afford a Conscience?"; H. S. Anderson, Youngstown Sheet & Tube Co., "The Manufacture of Steel"; W. Worley Kerlin, the Gray Iron institute, "Use for Scrap in the Gray Iron Foundry"; H. A. Schwartz, National Malleable & Steel Castings Co., "The Use for Scrap in the Malleable Foundry"; F. H. Figsby, New York, "Competition in the Reduction of Costs."

Subjects Cover Wide Range

Lee J. Workum, Portsmouth, O., "The Cost of Handling and Preparing Scrap"; Harry Cohn, Butler, Pa., "Latest Ideas in Organizing and Equipping a Modern Scrap Plant"; M. V. Bonomo, Jersey City, N. J., "Increasing Volume and Reducing Costs in the Scrap Yard"; F. W. Thurnau, Inter-Ocean Syndicate, Chicago, "The Struggle for Supremacy" and Murray N. Billings, Illinois Steel Co., Chicago, "What is Happening to the Scrap Rate Structure."

In addition, presidents of the 13 chapters of the institute will submit brief reports on conditions in their respective markets.

Five round table discussions on important aspects of the scrap iron industry have been scheduled. These include traffic, research, costs, scrap, and chapter welfare. The particular problems of the industry will be analyzed at each of these sessions, which will be led by qualified speakers.

Eight committees will hold meetings in connection with the convention. These include traffic, trade relations, railroad classifications, research, automobile scrapping, costs, arbitration and institute awards. The last named committee will announce the first award at the convention, to the individual who has done the most constructive work for the scrap iron industry.

Say Russia Not Competitor for Steel, Iron Business

Russia's increased output of steel and iron under the 5-year plan will not be exported in competition with other producing nations; in fact, she will still be importing steel and iron, two score executives of the steel, iron and metalworking industries of Cleveland were informed Feb. 28 at a dinner and round table discussion given by Samson D. Wright, vice president, Atlas Car & Mfg. Co., Cleveland.

Peter A. Bogdanov, chairman, Amtorg Trading Corp., New York, was the principal speaker. Other speakers, in addition to Mr. Wright, who was chairman of the meeting, included H. J. Freyn, president, Freyn Engineering Co., Chicago; R. C. Allen, vice president, Oglebay, Norton & Co.; W. A. Havens, vice president, Arthur G. McKee & Co., and Maurice Mendelson, director of information, Amtorg Trading Corp.

Say Steel Is on Eve of Its Greatest Development

Charles F. Abbott, executive director, and Lee H. Miller, chief engineer, of the American Institute of Steel Construction, were guests at a luncheon by steel construction engineers in Denver, Feb. 25. They stated that business generally is improving and as for steel, the age of steel is still in the future and the steel industry is on the eve of its greatest development:

"Solid steel dams which will outlive concrete; steel residences, that is, structures in which steel plays the biggest part, are some of the things steel engineers are ready to construct right now, and each day paves the way for more inroads for steel."

50,000,000 Tons of Scrap Consumed in 1929, Census Figures Show

CONSUMPTION of steel and iron scrap in industries of the United States in 1929, according to the census of manufacturers taken in 1930, covering operations of 1929, was 50,035,799 gross tons. This is the first compilation of figures on consumption of steel and iron scrap ever presented with government authority and the total is far larger than former estimates.

The total tonnage is composed of 36,263,501 tons presented in the accompanying table, where it is broken down into the industrial divisions from which figures were gathered, and 13,772,298 tons produced and reworked in steel plants, which were

Figures Show Scrap and Pig Iron Consumption

Industry	Establishments	PIG IRON Gross tons	PIG IRON Cost	SCRAP IRON AND STEEL Gross tons	SCRAP IRON AND STEEL Cost
Agricultural implements	94	211,875	$ 4,403,171	92,660	$ 1,308,405
Blast furnaces	82	....	....	5,673,176	32,744,377
Cars, electric, steam railroad	15	48,014	1,051,280	265,829	3,665,132
Cast-iron pipe and fittings	74	1,424,837	23,714,570	217,262	3,033,925
Engines, turbines, tractors, etc	58	291,751	6,204,655	179,538	2,733,989
Foundries, not elsewhere classified	2,284	3,465,824	68,974,773	2,834,505	40,240,358
Locomotives	10	21,351	418,539	6,025	95,318
Machine tools	39	65,093	1,351,646	40,512	654,263
Plumbers' porcelain enameled ware	37	235,711	4,445,167	36,260	513,516
Pumps and pumping equipment	53	64,606	1,318,915	29,270	464,975
Shipbuilding	20	5,429	118,658	1,568	19,405
Steamfitting, etc.	80	536,397	10,542,338	280,617	4,228,370
Steelworks and rolling mills	372	34,364,835	541,558,979	26,498,275	404,059,876
Stoves and ranges	199	344,296	6,630,339	87,265	1,223,655
Textile machinery, parts	30	66,532	1,437,631	20,739	290,202
Total	3,447	41,146,551	$672,170,661	36,263,501	$495,275,766

not included in the tabulation made by the government.

The value of the scrap included in the table, 36,263,501 tons, was $495,275,766. Steel works and rolling mills consumed 26,498,275 tons, costing $404,059,876.

The industries included in this tabulation account for all but a small portion of the total scrap consumed. Data for establishments engaged primarily in the production of steel castings for sale as such are included in figures for steelworks and rolling mills, but data for establishments producing steel castings for their own use in the manufacture of machinery are placed under the heading of foundries, this classification also including production of gray and malleable castings for sale or for own use.

The column giving the number of establishments included covers only those in each group reporting the consumption of scrap and pig iron and not the total number producing the articles indicated. The item covering steel plants and rolling mills includes an important automobile manufacturer's steel plant.

An effort was made unsuccessfully to collect data from manufacturers of automobiles but none was made to collect from railroad repair shops.

Figures on consumption of pig iron were gathered and tabulated on the same plan as applied to scrap steel and iron.

Employment Schedules Begin To Increase

Chicago — Rock Island railroad's shop at Silvis, Ill., reopened March 1 on a four-day weekly schedule for an indefinite period. The railroad's other shops reopened on the same day on a five-day schedule for at least two weeks. This will give employment to 2500 to 3000 men.

Dayton, O.—National Cash Register Co. here increased its operating schedules from three days to four days a week, effective March 1.

Cleveland—A gain of 33½ per cent in employment in February over January is reported by the public employment bureau here. This includes all occupations for which the bureau supplies labor.

Sheet and Tin Plate Mill Wages Reduced

Wages in sheet and tin plate mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will be lower in March and April than in January and February. Average sales price of Nos. 26, 27 and 28 gage black sheets in the first two months of 1931 was 2.60c. Hence wages will be down 3 per cent to 13½ per cent above base. Following is a comparison of price averages and wago changes:

Jan.-Feb., 1931	2.60c	—3 per cent
Nov.-Dec.	2.70c	—1.5 per cent
Sept.-Oct.	2.75c	unchanged
July-Aug.	2.75c	—4.5 per cent
May-June	2.90c	unchanged
March-April	2.90c	—4.5 per cent
Jan.-Feb., 1930	3.05c	unchanged
Nov.-Dec.	3.05c	unchanged
Sept.-Oct.	3.05c	unchanged
July-Aug.	3.05c	unchanged
May-June	3.65c	+1.5 per cent
March-April	3.00c	unchanged
Jan.-Feb., 1929	3.00c	unchanged

General Electric Reduces Public Relief Burden

Every employe of the General Electric Co. in Schenectady, N. Y., who has been out of work this winter, or even on part-time employment, has been cared for financially by the company's unemployment plan, thus materially lessening the burden of community relief work, it has been announced by Carl W. Snyder, chairman of the mayor's committee on unemployment in Schenectady.

"The mayor's committee now is caring for 900 families at an expense of $7000 per week, but it would have its relief work more than trebled if it were not for the splendid help from General Electric in caring for about 2200 of its employes," Mr. Snyder said.

Tarentum Steel Reviving Plans for Plant

Plans have been revived for financing construction of a $1,500,000 plant for the tarentum Steel Co., Tarentum, Pa., formed more than a year ago. The company was capitalized at $5,000,000 with issue of $3,000,000 in stock authorized. It is planned to build a mill on the site of the former No. 2 works of the Pittsburgh Plate Glass Co. for the production of flat rolled steel products.

A. W. Barrett, vice president and works manager, Miller Printing Machinery Co., Pittsburgh, is president. William Cole, formerly with West Penn Steel Co., Brackenridge, Pa., and Seneca Iron & Steel Co., Buffalo, is vice president.

Aims To Obtain List of Bethlehem Stockholders

A petition has been filed in the New York supreme court for a writ of mandamus to compel the Bethlehem Steel Corp. to reveal to Samuel D. Hopkins the names of the stockholders in the corporation. Mr. Hopkins is a member of the Midvale committee of Bethlehem stockholders.

The petition states that between 1917 and 1928 inclusive bonuses to Bethlehem officers amounted to $31,000,000, while dividends to common

Turn Over These Seven New Leaves and Business Will Be on Better Basis

UNDER the title "New Leaves To Turn Over," *Ingot Iron Shop News*, published by the Armco Distributors Association of America, Middletown, O., prints the following advice to assure better business:

1. *I will make sure of a fair and reasonable profit from every job I undertake.*
2. *I will not cut prices, either by substituting inferior materials for good or by paring my prices beyond the line of a fair profit.*
3. *I will devote a part of my time to the study of cost accounting, knowing that if I apply the principles I learn to my own business, they will return to me manifold increases in profit and peace of mind.*
4. *I will advertise consistently to the people I serve or hope to serve, recognizing that no business can thrive in the dark. I will realize that advertising, intelligently used, shows the way to my shop and enables my prospects and customers to see my services and qualifications in a favorable light.*
5. *I will attune my promotional efforts to those of reputable manufacturers and distributors, and take advantage of the assistance and suggestions they offer to me. This, because I know that even the wisest and most experienced captain of business cannot navigate his ship alone.*
6. *I will instruct and encourage and inspire the journeymen and apprentices who work with me to the best of my ability. My working span is limited; but this great chain of industry of which I am now a link must never be broken.*
7. *Finally—and I know this to be vital—I will open my mind to improved business practices, better materials, new trends and developments in sheet metal equipment, construction and products, and methods that will promote economy and efficiency for those whom I serve, and hope to serve.*

stockholders totaled about $40,000,000. The committee wants the names so that it may circularize the stockholders on the bonus issue. A suit is now pending in chancery court at Newark, N. J. Hearing on the petition was set for March 9.

Merger Hearing March 19

Youngstown, O.—Thursday, March 19 has been set as the date for the hearing of the appeal from the decision by Judge David G. Jenkins enjoining the merger of the Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. The case will be heard by the district court of appeals in Youngstown.

Delay Hearing on Pens

Washington—Hearing in connection with the tariff commission's investigation of rates on pens, not specially provided for, made of plain or carbon steel, and made wholly or in part of other metal, has been postponed to April 1.

Asks Bethlehem to Canada

Duke-Price Power Co., Quebec, Que., is reported trying to negotiate with the Bethlehem Steel Corp., Bethlehem, Pa., for the establishment of a plant in the Lake St. John district where the power company has developed a power project.

Ohio Foundrymen Discuss Practice, Safety, Business

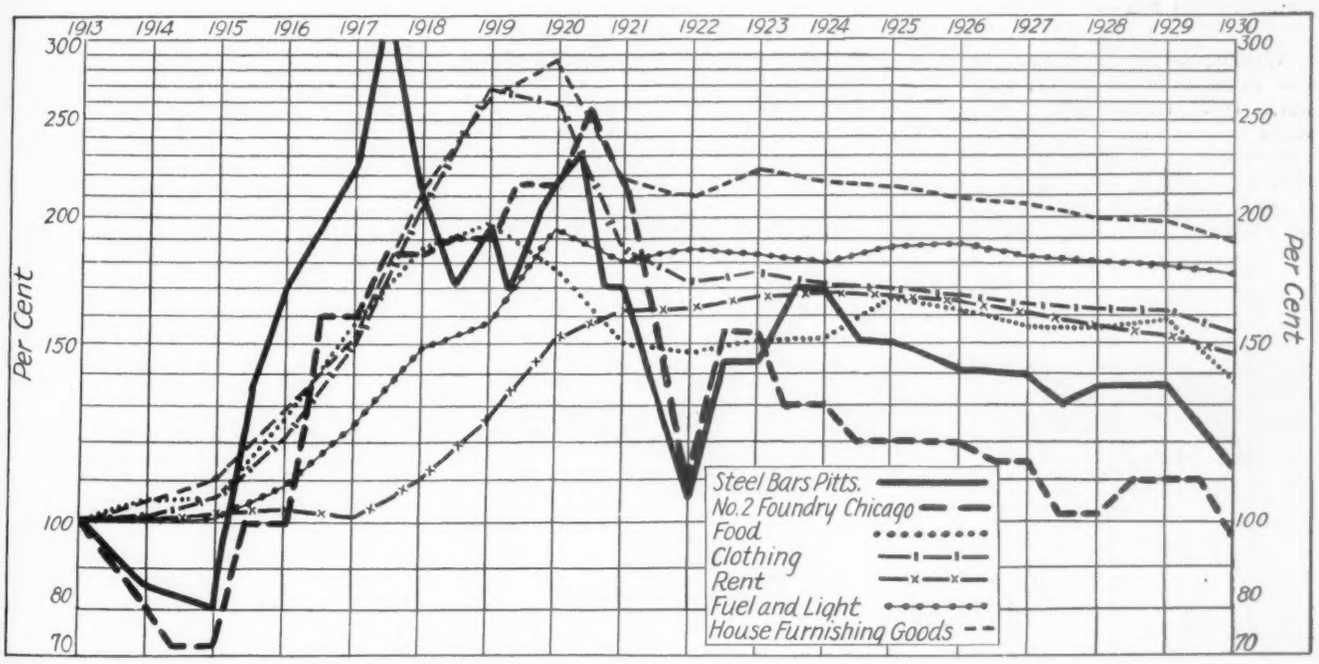
REGIONAL meetings, introduced last year by the Ohio Foundries Association Inc. were continued this year with the first meeting Feb. 27 at the Toledo Yacht club, Toledo, O., attended by about 70 members from various points in the northwestern section of the state. A proposal to adopt a monthly meeting night after the manner of many other foundrymen's associations was discussed and referred to a committee of three, with Charles Carson, National Supply Co., as chairman, to arrange details. April 15 was set as a tentative date for the first of these meetings.

Addresses were presented by H. M. Lane, H. M. Lane Co., Detroit, on "Some Features of Present Day Foundry Practice"; by A. D. Lynch, director of personnel, Ohio Brass Co., Mansfield, O., on "Safety Organization and Safety Program"; and by Pat Dwyer, engineering editor *The Foundry*, Cleveland, on "Meeting Present Day Competion."

Adoption and enforcement of a safety program in any plant, according to A. D. Lynch, is based perhaps as fully on economic as it is on humanitarian motives. If foundrymen could be convinced of this he felt the growth of the safety first movement would be accelerated to a remarkable degree. Conditions vary to a considerable extent in many foundries and no standardized program can be laid down. Desire for safer conditions is the most important factor and this desire must be unanimous and enthusiastic from the general manager to the apprentice boys.

Pat Dwyer directed attention to the fact that business peaks and depressions have manifested themselves many times in the experience of practically every person. Eventually, perhaps they may be abolished, but in the meantime they are as inevitable as the ocean tides. The business mariner must learn to accommodate himself to their rise and fall. The foundry business is not dead. It is not dying. The parent tree and most of the branches are flourishing as bravely as ever. The first law of economics is that to realize a profit and remain in business the income must exceed the outgo and only foundries observing this law can meet modern competition.

Steel and Iron Deflation Greater Than Other Commodities



That steel and pig iron have been deflated to a greater extent than food, clothing, rent, fuel, light and house furnishing goods is indicated in the above graph. On a chart presented by the New York Times, covering the latter six items, STEEL *has superimposed lines representing steel bars at Pittsburgh and No. 2 foundry pig iron at Chicago. The base is the price at the beginning of* 1913, *which is taken as* 100 *per cent. The chart indicates that pig iron now is lower than at the beginning of* 1913 *and steel bars are* 14 *per cent above the* 1913 *price*

Business News of Week in Washington; Anti-Russian Bills Held in Committee

VARIOUS bills imposing embargoes on all products manufactured wholly or partially by forced, indentured or convict labor, and designed to check trade between Russia and the United States, lay dormant in the senate finance committee when that body concluded its work for this session.

□ □ □

Industrial activity in January was subnormal for the month even in the face of a seasonal improvement in the steel industry, according to the Federal Reserve board.

□ □ □

Forty-five states will spend more than one billion dollars on road work this year, states the President's emergency employment committee.

□ □ □

Number of days of work lost by workmen in the United States because of industrial disputes last year decreased approximately 360 per cent, according to the bureau of labor statistics, department of labor.

□ □ □

The house commerce committee approved the Houston bill authorizing the Delaware and New Jersey Bridge Corp. to construct a vehicular toll tunnel under the Delaware river between New Castle, Del., and Salem county, N. J. Plans must be approved by the war department before construction can begin.

□ □ □

William Green, president, American Federation of Labor, states reports from trade unions show the rapid increase of unemployment was apparently checked in February but that wage cuts in January were nearly three time as numerous and affected nearly twice as many employes as in any month since the depression began.

□ □ □

In a general discussion of railroad consolidations, Senator Couzens, of Michigan, asked delay in approval of consolidations "until some definite evidence is presented to congress which will justify the placing of transportation facilities of the country in the hands of a few."

□ □ □

A joint resolution passed by the house would enable the house ways and means committee to make an economic investigation into the manganese industry. The resolution went to the senate March 3 with a fair chance of passage before adjournment at noon March 4.

Steel Treaters Announce New Publication Plans

The American Society for Steel Treating has announced that beginning with November its *Transactions* will be issued monthly and will be distributed to members without cost. Monthly publication of *Transactions* had been discontinued with the initiation of *Metal Progress*, the *Transactions* becoming an annual volume and obtainable only upon payment of $2.50. The new *Transactions* will contain only the complete papers presented at annual meetings and will not affect the status of *Metal Progress*.

Officers of the society were particularly gratified with the second Western Metal congress and Metal and Machinery exposition held in San Francisco, Feb. 16-20. Technical sessions were well attended and more than 50,000 people visited the show during the five days. Depressed business conditions affected the venture less than had been anticipated. The West Coast feels a need for greater technical development to keep pace with the rapid industrial growth. Plans already are under way for a third congress and exposition to be held in Los Angeles in 1933.

WINDOWLESS PLANT PLANNED FOR GREATER EFFICIENCY

Progress is shown in construction of the welded windowless plant of the Simonds Steel Industries at Fitchburg, Mass., being erected by the Austin Co., Cleveland. Controlled conditions, ventilation and illumination, with straight-line production layouts, are expected to increase efficiency 33 per cent

Financial News of Steel Industry

PROPOSED plan for refinancing Fulton Iron Works, St. Louis, has been ratified by a majority of stockholders, though it has not been determined how many stockholders will exercise their rights to subscribe to the proposed issue of $300,000 of first mortgage 5-year bonds.

□ □ □

Continental Steel Corp., Kokomo, Ind., has declared regular quarterly preferred of $1.75 a share, payable April 1 to record March 18.

□ □ □

Truscon Steel Co., Youngstown, reports for 1930 net earnings of $1.44 a common share, after deductions for taxes, depreciation and preferred dividends.

□ □ □

Ohio Seamless Tube Co., Shelby, O., reports current assets of cash, accounts receivable and government securities of $594,417, an approximate $145,000 increase over Dec. 31, 1929. Liabilities of $88,856 as of Dec. 31, 1930, compare with $253,921 at the close of 1929.

□ □ □

A. O. Smith Corp., Milwaukee, reports net profit for the six months ended Jan. 31 of $2,866,621, equal to $5.64 a share on the common stock. Earnings compare with $2,674,811, or $5.25 a share in the first six months of the previous fiscal year.

□ □ □

United Engineering & Foundry Co., Pittsburgh, reports net of $2,114,359 in 1930, equal after preferred charges to $4.86 a common share. Net for 1929 was $1,671,887, equal to $3.75 a common share. There was a $786,584 increase in company surplus as of Dec. 31, 1930, to $4,083,449.

□ □ □

Empire Steel Corp., Mansfield, O., stockholders authorized March 3 issuance of $7,000,000 in first A refunding mortgage bonds. Vote permitted the company to offer for prompt subscription a series of A first and refunding mortgage bonds not to exceed $1,780,000 from the stockholders. Depending upon sale among shareholders is the conversion of 550,000 common and 150,000 preferred shares into a total 175,000 shares, of which 75,000 will be class A shares and 100,000 class B shares.

Pig Iron Rate Up 19.5 Per Cent; 7 More Stacks Active

PIG IRON production staged a sharp recovery in February when the daily rate increased 19.5 per cent to 61,112 gross tons. This was the second improvement since pig iron production last May began the slide which was not stopped until January.

Insuring that the steel ingot report for February will also disclose improvement, there was a net gain of seven active blast furnaces, all of the steelworks variety, as of Feb. 28. On that day 109 of the 307 potential blast furnace stacks in the country were active. No merchant stacks were blown in or out in February.

AVERAGE DAILY PRODUCTION

	1931	1930	1929	1928
Jan.	55,337	91,573	110,742	92,113
Feb.	61,112	101,640	114,942	99,954
Mar.	.....	104,930	119,662	103,199
Apr.	.....	106,371	122,106	106,066
May	.....	104,564	125,753	106,219
June	.....	97,817	123,887	102,745
July	.....	85,110	122,016	99,120
Aug.	.....	81,455	120,845	101,193
Sept.	.....	75,893	116,548	102,120
Oct.	.....	69,851	115,747	108,824
Nov.	.....	62,182	106,081	110,155
Dec.	.....	53,732	91,513	108,702
Ave.	58,078	86,141	115,808	103,365

February's daily rate of 61,112 gross tons compares with 55,337 tons in January and 101,640 tons in February, 1930. Despite the shorter month, the February total of 1,711,137 gross tons of pig iron produced was almost equal to the 1,715,443 tons made in January.

Relating production to capacity, February was a 43.3 per cent month, contrasted with 39.2 per cent for January and 72.1 per cent for last February.

February production is divided into 336,085 tons of merchant and 1,375,052 tons of nonmerchant iron.

FEBRUARY PIG IRON OUTPUT

	No. in blast last day of month		Total tonnage made	
	Feb.	Jan.	Merchant	Nonmerchant
Ohio	23	21	66,551	289,507
Pennsylvania	35	32	39,799	458,221
Alabama	11	10	83,478	63,765
Illinois	12	12	83,416	134,407
New York	5	5	20,734	59,103
Colorado	2	2		
Indiana	8	7		
Maryland	3	3	6,609	242,875
Virginia	1	1		
Wisconsin	0	0		
Kentucky	1	1		
Massachusetts	1	1		
Tennessee	1	1	11,379	73,683
Utah	1	1		
West Virginia	2	2		
Michigan	3	3		
Minnesota	0	0	15,512	30,279
Missouri	0	0		
New Jersey	0	0		
Spiegel and ferro—all states			8,607	23,212
Total	109	102	336,085	1,375,052

MONTHLY PRODUCTION

	1931	1930	1929
Jan.	1,715,443	2,838,751	3,433,028
Feb.	1,711,137	2,845,937	3,218,376
Mar.	.....	3,252,822	3,709,518
April	.....	3,191,119	3,663,167
May	.....	3,241,477	3,898,344
June	.....	2,934,508	3,715,104
July	.....	2,638,441	3,782,511
Aug.	.....	2,525,105	3,746,198
Sept.	.....	2,276,781	3,496,454
Oct.	.....	2,165,374	3,588,146
Nov.	.....	1,865,458	3,182,420
Dec.	.....	1,665,715	2,836,917
Total	3,426,580	31,441,488	42,270,183

In February the Jones & Laughlin Steel Corp. lighted three stacks and blew out one. The Carnegie Steel Co. lighted one stack and blew out one. The Wheeling Steel Corp. blew out one stack. One stack each was lighted by the Bethlehem Steel Co., Sharon Steel Hoop Co., Republic Steel Corp., Tennessee Coal, Iron & Railroad Co., Hamilton Coke & Iron Co. and Inland Steel Co.

Two stacks were dismantled in February, bringing the potential number down to 307. These stacks were the No. 1 Farrell of the Carnegie Steel Co. at Farrell, Pa., and the Crane of the Warren Foundry & Pipe Corp. at Catasauqua, Pa.

RATE OF OPERATION

(Relation of Production to Capacity)

	1931†	1930†	1929*	1928‡
January	39.2	65.0	79.0	66.8
February	43.3	72.1	82.2	72.5
March	.....	74.5	85.5	74.8
April	.....	75.4	87.4	76.8
May	.....	74.2	89.8	77.0
June	.....	69.3	88.5	74.4
July	.....	60.3	87.2	71.8
August	.....	57.8	86.4	73.3
September	.....	53.8	83.3	74.1
October	.....	49.6	82.6	78.9
November	.....	44.1	75.8	79.8
December	.....	38.1	65.5	78.8

†Based on capacity of 51,490,790 tons Dec. 31, 1929; *on capacity of 51,069,895 tons; ‡on capacity of 50,329,750 tons. Capacities by American Iron and Steel institute.

Canadian Steel Output Up

Toronto, Ont.—Production of steel ingots and castings in Canada in January, 57,598 long tons, was 3 per cent over December, but 50 per cent under January, 1930. January pig iron output, 35,592 tons, was down 7 per cent from December, and less than half the month's output last year. January ferroalloys totaled 4467 tons, a gain of 27 per cent over December.

Furnaces Try Silicon Spiegeleisen as Deoxidizer

New York—About 15 steel companies recently have investigated use of 4 per cent silicon spiegeleisen as a furnace deoxidizer. New Jersey Zinc Co. has supplied quite a large part of this speigeleisen. This alloy was made at the company's blast furnace plant at Palmerton, Pa.

The new deoxidizer is the outgrowth of recent investigations by Dr. C. H. Herty Jr., United States bureau of mines, Pittsburgh, which showed that a deoxidizer containing both silicon and manganese in about the ratio of one part of silicon to five parts of manganese facilitates the production of clean steel relatively free of refractory silicate inclusions.

No consumers yet have used 4 per cent silicon spiegeleisen in straight steel production. So far the use of this material has been entirely along investigational lines.

Steel Castings Value Was $196,000,000 in 1929

One hundred and sixty-eight plants were engaged primarily in making steel castings in 1929, the manufactures census of 1930 revealed, and these produced 1,136,608 tons. In addition, 300,799 tons were made by castings departments, steelworks, iron foundries and machine shops.

The total value of these 1,437,407 tons of steel castings was $196,591,693. Castings for sale and interplant transfer totaled 1,241,053 tons, and for further manufacture in the same works 196,354 tons. Census data on the strictly steel foundries follow:

Number of establishments	168
Wage earners (average)	39,697
Wages	$66,358,531
Cost of Materials, fuel, and purchased electric current	$63,062,444
Products, total	$205,436,134
Steel castings	$176,354,082
Other products	$29,082,052
Value added by manufacture	$142,373,690

Cut Inventories Sharply

Inventories of 644 corporations in 27 different lines of industry and miscellaneous at the close of 1930 amounted to $1,016,213,746 and were in the aggregate 17.64 per cent less in dollar value than at the close of 1929, and 5.65 per cent less after adjustment for estimated price recessions, according to a preliminary survey made by Ernst & Ernst.

Steel Castings Drop Again After Brief Year-End Rise

Bookings for steel castings at 32 per cent of capacity in January dropped two points from December. Production also was down slightly, less than a point, at a total of 46,156 tons for January, according to report of 132 establishments to the department of commerce in the following:

1930	Total bookings tons	Per cent of capacity	Total production tons	Per cent of capacity
Jan.	101,500	70.3	109,009	75.5
Feb.	114,419	79.2	107,628	74.6
March	122,462	84.9	113,465	78.6
April	92,987	64.4	110,692	76.7
May	91,077	63.1	104,984	72.8
June	61,164	42.4	90,795	62.9
July	57,850	40.1	78,977	54.7
Aug.	50,370	34.9	64,303	44.6
Sept.	49,542	34.3	61,919	42.9
Oct.	45,552	31.6	59,522	41.2
Nov.	48,123	33.3	44,290	30.7
Dec.	49,387	34.2	46,290	32.1
(Year)	884,433	51.1	991,872	57.3
1931				
Jan.	46,631	32.0	46,156	31.7

River Traffic at Pittsburgh Largest Since November

River shipments of iron and steel products in the Pittsburgh district during January arose to a new high mark for that month. Movement over the three rivers was the largest since November. Shipments over the Monongahela river amounted to 90,405 tons, against 46,972 tons in December and 58,784 tons a year ago. The Ohio river tonnage increased from 50,403 tons in December to 88,089 tons in January. This compares with 64,736 tons a year ago. Comparative monthly figures follow:

1930	Allegheny	Monongahela	Ohio
Jan.	100	58,784	64,736
Feb.	210	80,327	74,385
March	100	111,702	109,911
April	1,000	70,229	66,482
May	.....	117,942	128,502
June	700	137,603	144,099
July	1,125	132,161	147,558
August	2,600	96,498	107,948
Sept.	5,100	106,079	109,129
Oct.	11,490	105,451	138,109
Nov.	17,850	75,202	95,644
Dec.	3,800	46,972	50,403
(Year)	44,075	1,133,950	1,236,906
1931			
Jan.	50	90,405	88,089

Gray Iron Foundry Group Says Production Is Up

Output of gray iron castings by members of the Gray Iron institute, Cleveland, showed improvement in January, and at 52.1 per cent of the average monthly output during the past three years was up four points from the 48.5 per cent of December.

New business in January was up four points to 51.4 per cent; unfilled orders were down two points to 34 per cent; material received rose 11 points to 60.3; and material on hand gained 26 points to stand at 150.7 per cent.

Foundries totaling 109 reported largely that business was poor, indicating a turn for the worse since the December report. One foundry said business was good, four said so in December; 43 believed the business outlook fair, against 53 in December; 52 foundries found business poor in both months; 13 reported their outlook bad in January against 24 with the same view in December.

Entire increase in production during the month occurred in foundries having 101 to 250 tons per month output.

Electric Trucks Slump Badly

January shipments of electrical trucks and tractors, as reported to the department of commerce by 10 leading manufacturers, consisted of 38 trucks and tractors. Comparisons follow:

1930	Total	Shipment—Domestic	Shipment—Export
January	140	123	17
February	113	106	7
March	123	109	14
April	106	101	5
May	144	125	19
June	95	63	32
July	108	99	9
August	92	81	11
September	81	75	6
October	93	90	3
November	45	36	9
December	51	42	9
(Year)	1,191	1,050	141
1931			
January	38	33	5

Foundry Output Improves

After setting a low for 1930 in November, production of castings by the 11 foundries comprising the Worcester, Mass., foundry council, has risen until January, 1931, output was 1,843,791 pounds. Monthly figures follow:

In Pounds

1930	
January	2,862,705
February	2,786,850
March	3,160,872
April	3,337,292
May	3,261,695
June	2,675,042
July	2,068,084
August	1,879,655
September	2,117,590
October	2,299,494
November	1,738,667
December	1,780,279
(Year)	29,966,225
1931	
January	1,843,791

Boiler Orders Depressed

New orders for 598 steel boilers were placed in January, according to reports to the bureau of the census by 74 manufacturers comprising most of the leading establishments of the industry. This compares with orders for 814 in December, which in itself was an improvement from the low of 1930 set in November. January's orders aggregated 576,723 square feet against 587,053 in December.

Orders for Electrical Goods Continue Downward

New orders booked during the fourth quarter of 1930, as reported to the bureau of the census by 81 manufacturers of electrical goods, were $195,546,657, compared with $217,818,078, for the third quarter of 1930. The following totals of bookings for each quarter include motors, storage batteries, domestic appliances, and industrial equipment:

Quarters	1929	1930
1st	$322,424,619	$298,733,208
2nd	340,863,112	276,732,039
3rd	338,169,678	217,818,078
4th	288,696,415	195,546,657
Total	$1,290,153,824	$988,829,982

Swope Stresses Research

Importance of research in future industrial activity was stressed by Gerard Swope, president General Electric Co., Schenectady, N. Y., in speaking at the annual banquet of the Engineers Society of Western Pennsylvania in Pittsburgh Feb. 19. About 1000 attended.

Mr. Swope cited strides made in recent years toward more efficient production of electric power and emphasized the necessity of retaining a portion of each year's profits for research and scientific developments.

George G. Crawford, president, Jones & Laughlin Steel Corp., Pittsburgh, was toastmaster.

Pig Iron Report Nears

Washington—It is expected that within the next few days the tariff commission will send its pig iron report to the President. The investigation was made as a result of a senate resolution. The present duty on pig iron is $1.12½ per ton, and at the hearing little opposition to an increase developed.

New Class Rates Deferred

Washington—The effective date of new class rates in official territory, under the decision of the interstate commerce commission in the eastern class rate investigation, has been further postponed until June 15. Tariffs will be issued 45 days in advance of their respective dates.

January Exports Off 9 Per Cent; Imports Are Steady

JANUARY foreign trade was disappointing, imports gaining less than 1 per cent and exports declining for the fourth consecutive month and being 9 per cent under December, 1930.

Imports increased 27 tons over December to total 40,781 tons for January. With one classification showing no exports, January returns disclose 29 instances of reduced exports against 16 increases, according to the iron and steel division, bureau of foreign and domestic commerce.

IMPORTS AND EXPORTS
Gross Tons

	1931		1930	
	Imports	Exports	Imports	Exports
Jan.	40,781	92,745	43,624	223,766
Feb.	.....	.....	43,326	197,336
March	.....	.....	56,618	238,333
April	.....	.....	53,686	208,640
May	.....	.....	54,315	196,120
June	.....	.....	48,955	159,392
July	.....	.....	39,700	131,772
Aug.	.....	.....	35,387	151,235
Sept.	.....	.....	40,285	131,211
Oct.	.....	.....	38,344	131,850
Nov.	.....	.....	43,095	111,968
Dec.	.....	.....	40,754	101,988
Total	.....	.....	538,089	1,983,611

The chief rise of the month in exports was that in skelp, 4709 tons, while the trade in plain structural shapes rose 1819 tons and that in hoops and bands 1624 tons. The trade in black steel sheets, however, was less by 11,397 tons. Other reductions to exceed 1000 tons include the 2132-ton drop in tin plate, the 1674-ton reduction in shipments of frames, sashes and sheet piling, and the 1586-ton decline in scrap exports.

Despite the 1586-ton reduction just noted, scrap, with a total of 9394 tons, remained the chief commodity in point of tonnage in January export trade. Shipments to Canada, 6293 tons, and to Japan, 1927 tons, accounted for the major proportion. Scrap topped the trade in plain structural shapes by only 60 tons and the 9394 tons of this last commodity exported went principally to Canada. Seamless and welded casing was steady at 4128 tons for January.

ORIGIN OF JANUARY IMPORTS
Gross Tons

	Steel ingots, blooms	Steel scrap	Cast iron pipe	Steel bars
Austria	.....	.....	.....	3
Belgium	1835	.....	.....	1504
British West Indies	.....	125	.....	.....
Canada	2	1551	1	6
Czechoslovakia	.....	.....	.....	9
Denmark	1	.....	.....	.....
France	174	.....	725	536
Germany	162	.....	.....	1884
Mexico	.....	.....	.....	7
Netherlands	.....	.....	.....	11
Norway	5	.....	.....	1
Sweden	61	.....	.....	255
United King...	13	38	.....	71
Total	2553	1714	726	4287

IMPORTS OF IRON AND STEEL PRODUCTS
Gross Tons

	Jan., 1931	Dec., 1930	Jan., 1930
Pig iron	11,141	13,881	9,080
Sponge iron	101	.....	.....
Ferromanganese, spiegeleisen (1)	2,783	1,111	5,490
Ferrochrome ..(2)	.....	.....	45
Ferrosilicon (3)....	270	274	469
Scrap	1,714	1,222	4,055
Ingots, blooms, etc.	2,253	1,926	1,785
Concrete bars	2,937	3,369	.....
Hollow bar, drill steel	78	48	2,299
Merch. steel bars	4,287	3,813	.....
Iron bars	109	203	.....
Wire rods	584	684	944
Boiler, other plate	56	*	657
Sheets, skelp	1,167	2,082	2,056
Tin plate	21	6	9
Structural shapes	6,779	5,041	8,950
Sheet piling	.....	.....	.....
Rails, fastenings..	299	198	599
Cast pipe fittings	726	1,889	952
Welded pipe	279	375	591
Other pipe	1,584	1,502	2,673
Barbed wire	629	377	377
Round wire	174	115	447
Flat wire, strip....	44	41	209
Wire rope, strand	156	180	297
Other wire	60	35	55
Hoops and bands	1,559	1,777	708
Nails and tacks....	584	479	595
Bolts, nuts, rivets	141	37	26
Castings, forgings	125	87	141
Total	40,781	40,754	43,624

(1) Manganese content. (2) Chromium content (3) Silicon content.

DESTINATION OF JANUARY IRON AND STEEL EXPORTS
Gross Tons

	Galvanized steel sheets	Tin terne plate	Black sheets	Steel bars
Argentina	18	590	485	11
Brazil	78	415	34	38
Canada	626	79	3680	2506
Cen. America..	174	.....	1	197
Chile	962	125	690	263
China	184	797	12	100
Columbia	397	125	9	120
Cuba	85	14	1	20
Dutch East Indies	174	181	.....	.....
Finland	17	.....	.....	.....
France	.....	.....	1316	.....
Greece	.....	99	.....	.....
Italy	.....	11	404	.....
Japan	41	1008	253	3
Java	46	181	1	.....
Mexico	582	741	196	27
Norway	57	.....	.....	.....
Panama	73	.....	.....	150
Philippines	37	561	88	70
Peru	.....	499	102	.....
Turkey	.....	.....	.....	327
United King...	.....	1	248	.....
Uruguay	56	578	.....	16
Venezuela	57	7	1	.....
Total	4036	6780	7691	3923

ORIGIN OF JANUARY IMPORTS
Gross Tons

	Iron Ore	Pig Iron	Manganese	Ferromanganese
Australia	5,507	.....	.....	.....
Brazil	.....	.....	7,640	.....
British India.	.....	8,336	2,871	.....
Canada	.....	.....	.....	776
Chile	111,714	.....	822	.....
France	.....	25	.....	.....
Germany	25	.....	.....	.....
Gold Coast	.....	.....	2,801	.....
Java	.....	.....	280	.....
Kwantung	.....	118	.....	.....
Netherlands..	.....	685	.....	.....
Norway	.....	51	.....	80
Russia	20,713	.....	2,860	.....
Spain	11,727	.....	.....	.....
Sweden	.....	1,876	.....	.....
United King..	.....	50	.....	1,927
Total	149,686	11,141	17,274	2,783

EXPORTS OF IRON AND STEEL PRODUCTS FROM THE UNITED STATES
Gross Tons

	Jan., 1931	Dec., 1930	Jan., 1930
Pig iron	419	474	2,133
Ferromanganese, spiegeleisen	.....	.....	126
Scrap (including tin plate scrap)	9,394	10,980	62,433
Ingot, blooms	600	319	3,329
Bars, iron	44	128	231
Bars, steel	3,923	2,932	11,857
Bars, alloy steel....	433	435	1,041
Wire rods	3,248	3,013	3,481
Skelp	7,957	3,248	4,754
Iron sheets, galv.	717	234	705
Sheets, galv.	4,036	4,799	10,449
Steel sheets, black	7,691	19,088	12,959
Iron sheets, black	713	714	1,217
Hoops, bands, strip	3,448	1,824	3,327
Tin, terne plate....	6,780	8,912	23,822
Shapes, not fabr...	9,334	7,515	14,109
Shapes, fabr.	4,494	4,096	5,408
Metal lath	186	350	407
Rails	1,264	2,546	5,667
Rail fastenings	503	1,085	1,669
Boiler tubes	769	765	1,478
Casing and pipe, seamless and welded	4,128	4,160	7,762
Malleable screwed pipe fittings	682	903	1,307
Cast-iron screwed pipe fittings	425	339	636
Cast-iron pressure pipe, fittings	883	1,079	838
Cast iron soil pipe and fittings	1,210	640	1,318
Welded black, galv. steel pipe..	4,703	4,418	9,660
Welded black, galv. wrought pipe	721	428	2,801
Plain black or galv. wire	1,508	1,689	2,886
Barbed wire, woven - wire fencing	2,767	1,842	2,433
Woven - wire screen cloth	65	84	170
Wire rope	248	270	412
Insulated wire and cable	65	74	44
Other wire	395	462	893
Wire nails	978	608	517
Tacks	37	43	43
Bolts, nuts, rivets	505	693	1,122
Iron castings	397	589	664
Steel castings	433	314	606
Car wheels, axles	975	1,227	783
Forgings	790	586	748
Total	92,745	101,988	223,766

Industrial Men in the Day's News

William B. Todd, General Manager of Sales, Jones & Laughlin Steel Corp.

A PERIOD of 30 years marks the scope of his industrial experience in the Pittsburgh and Beaver Valley districts of Pennsylvania.

WITH Union Drawn Steel from 1901 to 1918, he rose from a minor mill office position to be vice president.

JOINING the Jones & Laughlin cold-finished bar department in 1922, he now has jurisdiction over sales of all its products.

THIRTY years of experience in the steel industry comprise the industrial background of William B. Todd who last week was appointed general manager of sales of the Jones & Laughlin Steel Corp., Pittsburgh. This promotion follows a 9-year identification with the Jones & Laughlin interests, the past 12 months of which were served in the capacity of assistant manager of sales.

Mr. Todd has spent his entire life in the Pittsburgh and Beaver Valley districts. He was born in Beaver Falls, Pa., and attended the public schools of that city. His first employment following his graduation from Geneva college, Beaver Falls, was in 1901 when he joined the mill office of the Union Drawn Steel Co., also located in his home city. The years of affiliation with that company gave Mr. Todd a broad experience in the cold-finished bar industry as well as in steel selling, his early connection being followed by promotions through various departments of the organization, culminating in 1918 when he was made vice president.

Four years later he left the Union Drawn company to join the Jones & Laughlin Steel Corp. as manager of sales of the cold-finished division. He held this position until 1930, when he was named assistant manager of sales. In his present capacity he succeeds the late Clinton S. Bradley.

Mr. Todd is a member of the American Iron and Steel institute and the Society of Automotive Engineers. Club affiliations include the Duquesne, Longue Vue Country and Beaver Valley Country clubs and the Pittsburgh Athletic association. As these memberships indicate golf is one of his favorite recreations.

W. B. CALDWELL resigned as general superintendent of Sharon Steel Hoop Co., Sharon, Pa., effective March 1. He became assistant to the vice president in charge of operations in 1919 and later was promoted to general superintendent.

C. W. Pfeffer, superintendent of Sharon works, and E. R. Griffith, traffic manager, also resigned, having been with the company 11 and 25 years, respectively.

J. M. Hughes, formerly superintendent of Lowellville, O., plant, Sharon Steel Hoop Co., has been appointed general superintendent of all plants, to succeed W. B. Caldwell.

Joseph Carter has been made Lowellville superintendent succeeding Mr. Hughes, and E. E. Reagle is superintendent at Sharon, to succeed E. E. Pfeffer. C. F. McBride has been made traffic manager in succession to E. R. Griffith.

□ □ □

John B. Partridge Jr. has become affiliated with the Charles Dreifus Co., Philadelphia, dealer in iron and steel scrap.

□ □ □

Miles C. Smith, for the past two years manager of sales promotion for the Stoody Co., Whittier, Calif., manufacturer of welding rods and welding equipment, has resigned.

□ □ □

J. F. Griswold has been elected president and board member of Foote Bros. Gear & Machine Co., Chicago, to succeed W. C. Davis, who resigned at the recent annual meeting. Other new officers are: Vice president, F. A. Emmons; secretary and treasurer, A. L. Gray; assistant treasurer, J. R. Fagan; and assistant secretary, O. R. Moss. W. A. Barr and H. A. Bates were re-elected vice presidents.

□ □ □

James W. Witmer, sales manager of J. I. Case Co., Racine, Wis., since 1916, has been made assistant to C. R. Messinger, president of Oliver Farm Equipment Co., South Bend, Ind. Except for a short period Mr. Witmer had been connected with the J. I. Case company since 1902.

□ □ □

Fred L. Flanders, executive vice president of Houdaille-Hershey Corp., Detroit, has been elected president and board member of Jackson Motor Shaft Co., Jackson, Mich., succeeding Otto S. Schulz, resigned. Other officers elected are: T. M. Carpenter, vice president and general manager;

Melville C. Mason, secretary; M. D. Harrison, treasurer, and M. Rosenberger, assistant treasurer.

□ □ □

Herman R. Neff, of George S. Rider Co., Cleveland, was elected a director of the Lamson & Sessions Co., Cleveland, at the recent annual meeting, to succeed H. L. McNichol.

□ □ □

W. Kimball Leach, formerly general manager of General Alloys Co., Boston, has been elected first vice president. He has been with the company since January, 1923.

□ □ □

William MacFadden, formerly vice president of Chicago-Naugatuck Crusible Co., has become an executive in the Bartley Crucible & Refractories Co., Trenton, N. J.

□ □ □

Harry T. Silver, formerly vice president of Youngstown Boiler & Tank Co., Youngstown, O., became associated with Adamson Mfg. Co., East Palestine, O., steel tanks, etc., effective March 1.

□ □ □

D. C. Prince was on Feb. 12 appointed engineer of the switch-gear department, General Electric Co., Philadelphia. The appointment includes supervision of switchgear research activity at Schenectady, N. Y.

□ □ □

O. H. Schriver, for ten years past general manager of Imperial Foundry Co., Knoxville, Tenn., has been elected vice president and general manager of Knoxville Foundry & Machine Co., Knoxville.

□ □ □

J. P. Long, identified with the by-product sales division of Corrigan, McKinney Steel Co., Cleveland, since the coke plant was built in 1917, has been appointed manager of that division.

□ □ □

George R. Sullivan has resigned as vice president of Rogers Brown & Crocker Bros. Inc., New York. For many years he was with Rogers, Brown & Co., and the succeeding company in Philadelphia.

□ □ □

Oscar E. Zenker, formerly vice president and production manager of Reliance Bronze & Steel Corp., Brooklyn, N. Y., has been placed in charge of the New York office at 101 Park avenue of the Metal Forming Corp., Elkhart, Ind.

□ □ □

D. S. Oakley, who for 12 years past has been New York district sales manager for Yates-American Machinery Co., Beloit, Wis., has been appointed Detroit district sales manager for J. A. Fay & Egan Co., Cincinnati.

□ □ □

C. S. Bravin, who has been with the Electro Metallurgical Co. of Canada Ltd. Welland, Ont., for 20 years, has been appointed sales manager in Canada. For the past six years he has supervised local sales and purchasing departments.

□ □ □

Howard Butt, recently made manager of the New York engineering and export department of William Powell Co., Cincinnati, manufacturer of valves and engineering specialties, will have headquarters at 50 Church street, New York.

□ □ □

A. J. Vierling, president of Paxton & Vierling Iron Works, Omaha, Neb., since early last year, has been elected chairman of the board. Other officers are: D. T. Moltrop, president, F. E. Owen, vice president and manager and Hird Styker, secretary and vice president.

□ □ □

Eugene Brandeis was recently elected president of Lundie Engineering Corp., New York. He succeeds the late Dr. John Lundie, whose death Feb. 9 was reported in STEEL of Feb. 19.

L. B. Armstrong was elected vice president with headquarters in Chicago.

□ □ □

Dr. Charles L. Parsons, secretary of the American Chemical society, Washington, since 1907, has been appointed business manager, a newly-created post.

Dr. Charles L. Reese of E. I. du Pont de Nemours & Co., Wilmington, Del., was made chairman of the board of directors of the society, the board having been increased from 10 to 14 members.

□ □ □

B. Dalton Divine has been elected treasurer of Devine Bros. Co. Inc., Utica, N. Y., flexible grinding, polishing and buffing tools and equipment, and R. Irving Roberts has been made secretary and assistant treasurer. O. J. McKeown formerly was secretary-treasurer. B. M. Beach is assistant secretary. Other officers are B. H. Divine, president, and Robert T. Kent, vice president.

□ □ □

Walter W. Bricka will resign on March 31 as general manager and director of Goodell-Pratt Co., Greenfield, Mass., manufacturer of tools, etc., after a 2-year connection. He is an associate of the Ellory A. Baker Co., New York, industrial managers, and terminates his services upon the merger of Goodell-Pratt Co., and Millers Falls Tool Co.

□ □ □

Thomas Cocker, formerly manager at Cleveland for Chain Belt Co., Milwaukee, has been transferred to Buffalo. He succeeds Frank Gary, who has been transferred to St. Louis to succeed J. M. Smallshaw, who now is manager of the Cleveland territory.

Hy Bergis was transferred from Seattle to Portland, Oreg., and Gerald Nichols now is located at Seattle. W. F. Nichols continues as Northwest manager.

Obituaries

BROWN JOYCE, 40, vice president and general sales manager of Wallace Barnes Co., Bristol, Conn., manufacturer of wire springs and screw machine products, died Feb. 26. He had been affiliated with the Wallace Barnes Co. about 12 years and in 1919 was made district sales manager at Detroit. Shortly after he was transferred to Bristol to become general manager of sales.

□ □ □

W. T. Moore, 35, identified with the order department of Jones & Laughlin Steel Corp., Pittsburgh, died Feb. 27.

□ □ □

John J. Shyrock, 77, director and founder of Meadville Malleable Iron Works, Meadville, Pa., died Feb. 23.

□ □ □

William B. Eisert, foundry superintendent for 38 years of the Pennsylvania Boiler Works, Erie, Pa., died recently.

□ □ □

Harry P. Readmon, 53, purchasing agent, Chicago Pneumatic Tool Co., New York, for the past 12 years, died Feb. 26.

□ □ □

E. G. Ackerman, 55, superintendent of Dayton Castings Co., Dayton, O., died as a result of an automobile accident Feb. 27.

□ □ □

William E. Elliott, 64, president of Elliott Machine Corp., Grand Rapids, Mich., which he founded 40 years ago, died Feb. 25 in Lynn, Mass.

□ □ □

Henry B. Utely, 76, vice president and director of International Harvester Co., Chicago, since 1919 until his retirement last year, died recently at Beverly Hills, Calif.

□ □ □

George F. Spencer, 78, who last year retired as chairman of the Frink Co. Inc., New York, manufacturer of reflectors, lighting specialties, etc., died Feb. 25 in Upper Montclair, N. J.

□ □ □

George J. Mockley, 72, president of Middle States Foundry Co., Milwaukee, died in Seattle Feb. 24, where he had resided for 15 years. He was president of South Seattle Foundry Co., Seattle.

□ □ □

Orville P. Blake, district sales manager at Kansas City, Mo., for Inland Steel Co., Chicago, died Feb. 25. He has been with the company since 1906, when he became St. Louis office manager. He represented the company in Washington during the World war and returned to Chicago in 1919, traveling the western territory until 1925, when he established the Kansas City office.

□ □ □

Nat H. Shiels, who has had charge of scrap iron and steel at the Cincin-

(*Concluded on Page* 117)

Here and There in Industry

INLAND IRON WORKS, Okmulgee, Okla., organized by a group of former officials of United Iron Works Inc., was successful bidder when the latter's Okmulgee plant was sold at receiver's sale recently. L. T. Lebow is president of the Inland Iron Works. Plans are being made for operations on an enlarged scale.

□ □ □

Crompton & Knowles Loom Works, Worcester, Mass., has re-elected its officers and directors without change, for the ensuing year.

□ □ □

J. B. Beaird Corp., Shreveport, La., has bought the Latex Iron & Steel Works, also of Shreveport, and has merged its business.

□ □ □

Minneapolis Moline Power Implement Co., Minneapolis, is building a factory distribution branch in Los Angeles.

□ □ □

General Seal & Lock Corp., 25 Devon street, Arlington, N. J., has taken space for general offices in the Lefcourt Newark building, Newark, N. J., as part of its expansion program. T. George Stiles is president.

□ □ □

Kimball-Krogh Pump Co. and Victor Welding Equipment Co., Los Angeles, are being merged under the name of Victor Equipment Co. Stock of the new company will be exchanged for that of the two concerns.

□ □ □

Warman Steel Casting Co., Los Angeles, has been licensed by the Krupp Nirosta Mfg. Co. to act as southern California manufacturer of Nirosta KA2 castings of corrosion resistant steel.

□ □ □

Western Metal Mfg. Co., Houston, Tex., has opened a branch office and fabricating shop at Harlingen, Tex. The new plant will be devoted to fabrication of corrugated and galvanized pipe for the irrigation industry.

□ □ □

Schiavone-Bonomo Corp., 11 West Forty-second street, New York, dealer in steel and iron scrap, has opened offices in the Pennsylvania building, Fifteenth and Chestnut streets, Philadelphia. Alan R. Hoffer is in charge.

□ □ □

Clark Controller Co., Cleveland, manufacturer of electrical and mechanical equipment, owning and operating the Sundh Electric Co., Newark, N. J., manufacturer of electrical devices, has opened a district sales and engineering office at 1605 Arcade building, St. Louis.

□ □ □

Harris Calorific Co., Cleveland, manufacturer of welding supplies, has appointed Oklahoma Welding Equipment & Supply Co., Tulsa, Okla., its distributor in Mid-Continent territory.

□ □ □

O'Fallon Co., Telephone building, St. Louis, has been appointed by the Otis Steel Co., Cleveland, its representative in St. Louis territory. George E. Sevey will continue as special representative.

□ □ □

Basic Products Co., Pittsburgh, has leased the plant of the Kennedy Refractories Co. at Bettsville, O., for ten years. The Basic company has plants at Peeples, O., Lawton, Ky., and Kenova, W. Va.

□ □ □

Erie Meter Systems Inc., Erie, Pa., manufacturer of gasoline pumps and filling station equipment, has purchased a plant in Tulsa, Okla., and will establish a branch manufacturing establishment there, employing about 100 men.

□ □ □

Northwestern Electric & Machinery Co., 690 National avenue, Milwaukee, has changed its name to the Hyjen Co. It manufactures electric motors and equipment. Hyman Meyer is president, Jennie Meyer vice president and Sylvia Meyer secretary.

□ □ □

Fuller Lehigh Co., E. G. Bailey president, has moved its general offices from Fullerton, Pa., to 85 Liberty street, New York, and manufacturing operations formerly carried on at Fullerton have been transferred to Barberton, O.

□ □ □

Unit Standard Lock Co., Sapulpa, Okla., manufacturer of padlocks, has been acquired by G. W. Miller, former owner of Miller Sand Pump Co., Sapulpa. Mr. Miller will operate the plant under the same name, with possible expansion of facilities later. Mike Jankowsky, of Tulsa, was the former owner.

□ □ □

Newbury Mfg. Co., Monroe, N. Y., manufacturer of steam fittings, gray iron castings and skylight opening devices, which recently bought the plant of the J. & B. Foundry Co. at Talladega, Ala., will continue to operate its plant at Monroe, where it has been established for 30 years. No change will be made in its plans as to the Monroe plant.

□ □ □

American Steel Co. of Indiana, Terre Haute, Ind., which has been in receivership for some time, will be liquidated and its plant sold at public auction March 17 by Industrial Plants Corp., auctioneer. It will be sold piecemeal for dismantling and will not be offered as a whole. Two 20-ton open-hearth furnaces are included in the equipment.

□ □ □

Magic City Improvement Co. has been organized and incorporated at Tulsa, Okla., with capital of $500,000 to manufacture a hydraulic pump for oil wells. Walter Whiteside, Tulsa, is president. Waite Phillips, Tulsa, and E. W. Marland, Ponca City, Okla., are large stockholders. A shop building at 1414 East Fourth street, Tulsa, has been leased. Charles G. Boone will be shop manager.

□ □ □

Edward J. Lamothe Co., 25 Chestnut street, Somerville, Mass., manufacturer of sheet metal products, has been incorporated under the same name it bore previously. A new plant and offices are being constructed for occupancy about March 1, at Wyllis avenue and Green street, Malden, Mass. Until then the business will be conducted at the Chestnut street location. Edward J. Lamothe is president and treasurer.

□ □ □

Wilson-Brown Inc., machine tool dealer and agent, 30 Church street, New York, will represent William Sellers & Co. Inc., Philadelphia, machine tool manufacturer, having been recently appointed dealer-agent in New York. Until recently, the Sellers company has handled its sales in the district direct from the Philadelphia headquarters. Wilson-Brown Inc. will also distribute the new Regal line of small lathes made by R. K. Le Blond Machine Tool Co., Cincinnati.

□ □ □

Link-Belt Co., Chicago, has appointed Stockland Equipment Sales Co., 2628 University avenue S. E., Minneapolis, its sales agent for shovels, cranes and draglines in Minnesota, except Duluth territory, and part of central west Wisconsin. The company has representation in important centers in this territory. Distributors of Link-Belt automotive timing chains have been appointed in several territories, as follows: Automotive Bearings & Equipment Co., 713 Sycamore street, Cincinnati; Cartier & Bulman, 2613 Baker avenue, Bell, Calif.; Taft Auto Specialty Co., 305 Center street, Taft, Calif.; Roper Auto Parts Co., 2554 Randolph street, Hunting Park, Calif. Joe C. Tucker, Morganfield, Ky., has been appointed agent in his territory for Link-Belt portable loaders.

MIRRORS of MOTORDOM

DETROIT

AUTOMOBILE output is improving, but the gain this week over last is slight in point of total cars produced. Sentiment, for the moment, is running ahead of actuality, though production trend is undeniably forward.

For all automobile manufacturers, output of about 51,000 cars and trucks this week barely betters the 50,000 units which was the rate for each of the last two weeks of February. It appears that February output topped 200,000 units, compared with 171,903 in January and 155,601 in December.

Ford seems to be swinging into a better stride and again has forged ahead of Chevrolet. This week the Ford schedule is about 18,000 units, while Chevrolet remains unchanged at about 15,000.

Automobile manufacturers are broadening their releases to material suppliers. For body plants and parts makers, February was the best month since the second quarter of 1930.

Ford A Changes to Come; Production Curve Rising

Ford will shortly introduce Model A bodies 2 inches longer and 2 inches wider. Briggs and Murray are working on the all-steel coach work.

Other minor refinements give indication of taking place. Among them is the slanting windshield for all A models. Incorporated now on the victoria model alone, this feature will be adopted first for the town car and other deluxe models before application is given it down the line.

A three-spoke steering wheel, while not to be introduced for a while, gives promise of supplanting the present four-spoke driving wheel.

And now Ford experimental and engineering staffs are studying the feasibility of free-wheeling transmission for Model A.

Regarding current production, Ford's curve has been a steadily rising one since the beginning of February.

From 11,000 to 12,000 units a week as the month opened, is stepping up to 14,000 the second, about 17,500 for the third, and last week the figure stood at approximately 18,000 units.

Working days are limited to three and four a week, depending upon the department.

Further Though Slight Gains as March Begins

There has been increasing thought that Ford would shortly go to a five-day week, back to the working period it inaugurated and made so famous, but on the basis of steel releases for March it appears that this may be delayed a while at least.

For March the 100,000 cars tentatively outlined two weeks ago will, in all probability, be toned down some in practice. An accurate gage lies in March releases for about 75,000 to 80,000 of a certain part, one of each to a passenger car, and on which one maker enjoys a monopoly.

The Ford steelworks operates seven to eight open hearths, the number varying within the week.

Chevrolet, steady at 5 days, approximately 3000 daily, will have made about 64,000 units when February is finally added up. March production is slightly better in outline, due for one reason to a longer month.

Having issued large releases about three weeks ago that would carry it into early March, Chevrolet is preparing for fresh ordering.

Buick has rallied. Replacing the former 4-day week, in effect since the first of the year, this subsidiary of General Motors has added another working day to the week, with an even flow of approximately 500 models from the assembly lines each day.

Oldsmobile has stopped its spectacular production gains and rests steady at the 300-unit day, 5 days, this week, a level attained about two weeks ago.

Oakland-Pontiac output, very comparable to Buick's, is an approximate 500 daily, 5 days. About 500 additional men were recently recalled to the Oakland-Pontiac division.

Hudson-Essex is feeling a little better over 1400 cars weekly, but still divided among three working days on output for both Hudson and Essex.

Studebaker is good at 300 daily, 5 days; Reo is 40 to 45 a day, 5 days; Marmon the same as Reo; Packard, 75 daily, 4 days; Pierce-Arrow, 25 to 30, 5 days; and Hupmobile, 5 days, 80 a day for both Cleveland and Detroit plants combined.

Chrysler Corp.'s activity may be laid largely at Plymouth's and Dodge's doors. The former is at 150 cars daily, 3 days; the latter at some 450 a day, both trucks and passenger models; Chrysler itself works 3 days, 100 daily. DeSoto is slack at 35 daily, 3 days the week.

Ford Open Hearths Get 21,500 Tons from Wrecks

Willys-Overland has outlined about 10,000 cars for this month, but if December and January history repeats itself this figure may prove a little ambitious. Current operations are at 400 daily, 4 days.

Graham-Paige makes 140 cars a day, 5 days. The new DeVaux is expected in production soon.

Cadillac-LaSalle production of LaSalle is about 45 daily; Cadillac 8 and 12 each at around 30 a day; Cadillac 16 two to three daily, all divisions 5 days a week.

◆

Newton Steel Co. is preparing to start its Monroe, Mich., plant, at least a part for the present. Great Lakes Steel Corp., after operating all six open-hearth furnaces for a week or

(*Concluded on Page* 117)

EDITORIAL

Scrap an International Factor in Steel Industry

SINCE steel is the most important factor in modern material civilization and its production and utilization are increasing steadily, the elements for its production are of greatest importance. Some nations, like the United States and France, possess practically unlimited stores of iron ore and thus are self-contained. Others, notably Italy and Japan, must rely on other countries for their raw materials if they are to manufacture steel for their industrial use.

From this situation an international interest in scrap is developing and the once humble steel discard is assuming a position in the treaties of nations. Countries requiring tonnage for import are bartering other advantages in return for specified annual shipments, while other countries, better endowed, are yielding tonnages in return for other concessions. Italy earnestly devotes the efforts of her foreign office to obtaining promise of scrap shipments from other European nations and Poland and Germany negotiate that the former may obtain scrap from the latter. Japan and Italy both take heavy tonnages from outlying sections of the United States where it is not readily available for land shipment to domestic users. The Argentine has forbidden all export of scrap and other countries have been considering conserving their supplies.

Potential World Supply Grows as Steel Production Continues Expansion

Advances in metallurgical methods have made possible increased proportionate use of scrap, to the great saving of iron ore reserves. At the same time, economic factors favor a larger use of scrap in many instances, in competition with iron ore.

As the quantity of steel and iron in use in the world is added to by millions of tons annually the quantity of potential scrap to be returned eventually for remelting constantly grows.

While it is a remote contingency it is not impossible to imagine a day when iron ore may not be necessary to carry on the world's steel and iron industry. Sufficient scrap may be available in some distant era to provide the entire output of steel called for by human needs. This could become a fact only at a saturation point when a balance had been reached that would have on the one hand an obsolescence equal to demand for new material on the other.

Meanwhile, machinery for handling this increasingly important factor is being developed steadily and the industry is assuming a place befitting its importance. Organization has been under way for several years and has made much progress in unifying practice and standardizing methods and results. A significant feature of this American development is a recent rapprochement of the central organization in the United States with similar organizations in Europe, for exchange of information and mutual benefit. In this way the scrap industry is being internationalized further.

Changes in Practice Cause Constant Adjustment to New Conditions

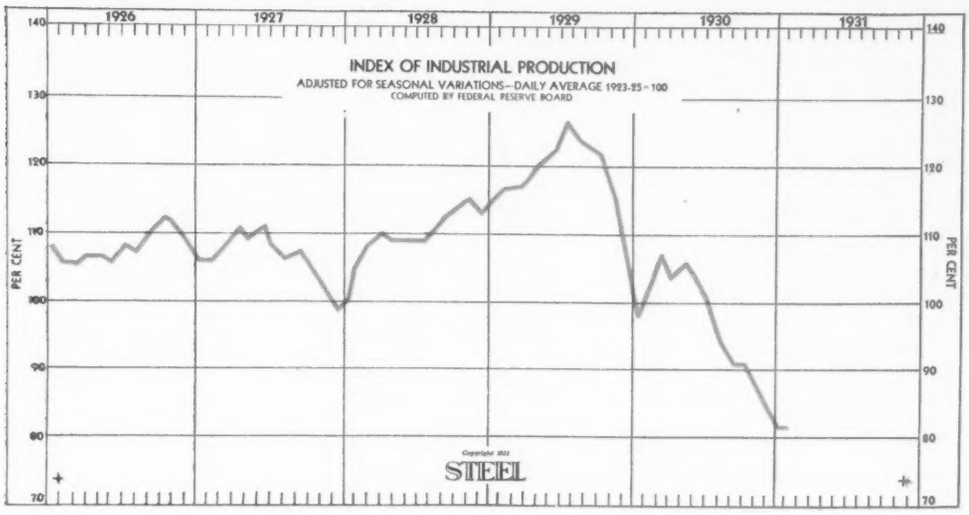
Constant change is going on in production and utilization of scrap, requiring adjustment of the trade to meet conditions. Where once, for example, steel foundries used pig iron in their open-hearth furnaces, scrap now is used almost exclusively, in electric furnaces. This use allows close adherence to specifications and finely adjusted refinement.

Changes in other ways tend to limit or to expand the relative tonnage of various grades. Thus an increased use of welding in structural fabrication, with a curtailment of riveting, might lessen the tonnage of low phosphorus punchings, which come largely from production of rivet holes. Increasing use of alloy steels has caused problems which are being met as they develop and in this the industry is proving its adaptability.

The amazing growth of the steel industry in the past few decades has been paralleled closely by that of the iron and steel scrap industry. Metallurgy has proved the intrinsic value of discarded metal and the early prejudice against its use has been overcome. Advantages inherent in the use of metal already well refined have appealed to steel producers, and science has bettered the methods for its utilization. As the world has risen to appreciation of steel as an agent of civilization it has realized the need of scrap in place of iron ore in countries which have small supplies of the latter. Thus internationally scrap has become an important factor.

The United States has become a great reservoir from which other nations draw supplies for their needs, taking material available at points distant from steel producing centers and transporting it cheaply by water to the other side of the world.

THE BUSINESS TREND



1930	
Jan.	103
1929	
Dec.	99
Nov.	106
Oct.	117
Sept.	121

1931	
Jan.	82
1930	
Dec.	82
Nov.	84
Oct.	88
Sept.	91

February Business Gain Was Moderate but Steady

MOVING slowly but nevertheless with increasing steadiness, business continues to improve. While the progress made in February was not rapid, moderate gains were held tenaciously and no serious relapse occurred.

Steelworks operations, beginning the past month at a rate of about 48 per cent, climbed step by step to 53 per cent as February closed. This upward movement in the rate of steelmaking was accompanied by commensurate gains in finishing operations. A number of blast furnaces were blown in during the month, and keeping pace with steel production, January's gain in pig iron output apparently was extended into February.

General commercial activity as revealed in freight car loadings has followed a restricted course, unmarked by variations of consequence from week to week. The general level continues to make comparisons with the previous year appear unfavorable. It may or may not have been an accident that the loading of 720,689 cars in the second week of February amounted to a slight gain, whereas the corresponding week last year witnessed a slight seasonal drop from a level then higher.

Industrial Production Index Resists Further Downward Revision

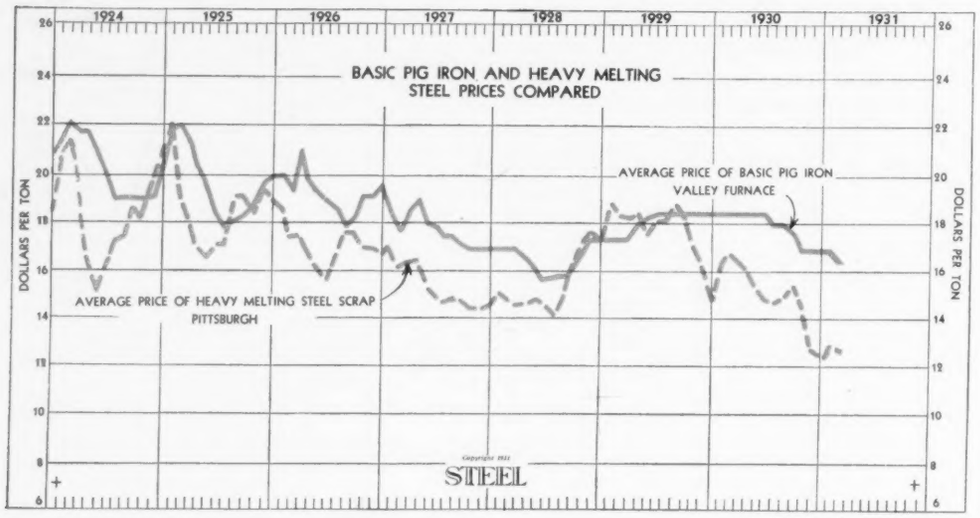
Although the picture of industrial production during February must as yet be pieced together, there is in the background the tabulated record for January, compiled by the Federal Reserve board. The board's index of industrial production, unadjusted, moved upward and with allowances for seasonal variation, maintained its position at 82. January's stand is the first interruption to a declining trend since September, when a similar stand was made at 91. The general downward path has prevailed since last April, when the indicator was at 106.

Diversified Demand Forms Basis for Trend of Near Future

Requirements of material in the automotive field have been aided by slight advances made each week in the rate of passenger car output. Increases in the past two weeks have been small but cumulative. A pickup in sheets and strip thus has been brought about in certain quarters, and pig iron shipments in the lakes regions strengthened in response to the same factor. The railroads continue in their cautious position. Demand scarcely can be characterized in terms of specific elements, diversification being a significant feature of the situation.

Prices apparently point to no new trend. Wholesale commodities, represented by 200 items in Irving Fisher's index, continue to retreat gradually. The latest recession of 0.5 of a point was sufficient to bring the index to a new low for the past 15 years.

As additional facts are made clear concerning the actual status of business during the past month, and as the course of the present month's transactions gradually takes form, comparisons with last year will become more and more interesting, and perhaps more and more significant. It was during this same period last year that business activity, expanding with the turn of the season, first began to show signs of faltering. In 1930 steel ingot production gained slightly in February, reaching 84.88 per cent of capacity, after which the decline began. Pig iron output marched upward from 65 per cent at the beginning of 1930 to 75.4 per cent in April before it too met with reverses.



Basic Pig Iron

	1931	1930
Feb.	$16.75	$18.50
Jan.	17.00	18.00
	1930	**1929**
Dec.	17.00	18.00
Nov.	17.00	18.50

Heavy Melting Steel

	1931	1930
Feb.	$12.75	$16.90
Jan.	13.00	16.55
	1930	**1929**
Dec.	12.75	15.00
Nov.	13.20	16.30

Heavy Melting Steel Price Loses Ground Gained in January

Coincidental with a drop in pig iron prices in the valley market, the scrap barometer, heavy melting steel, in February turned back downward to its December quotation after gaining in January. Basic pig iron, valley furnace, dropped from $17 to $16.75 for the month, while the Pittsburgh price for heavy melting steel reverted to $12.75, which price in the last month of 1930 had established a new low since September, 1921. The scrap market weakened in the latter part of the month as buying was absent. Readjustments took place in several grades, certain weak spots appearing in the Chicago district and certain other items strengthening slightly in the Cleveland market.

January Gain in Automobile Output Amounts to 10 Per Cent

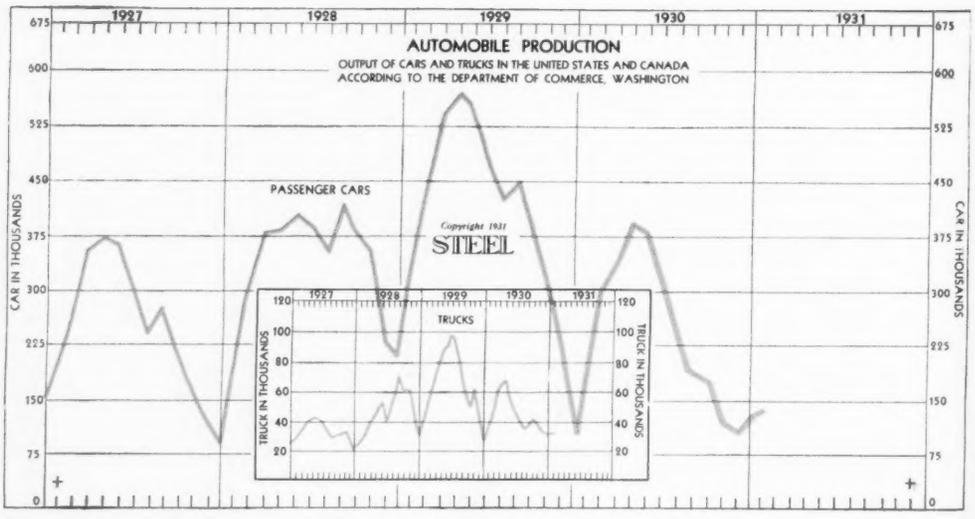
Output of automobiles in the United States and Canada made a gain of more than 10 per cent during January, and achieved the second successive rise. Total passenger cars and trucks produced were 178,399, of which 144,878 were passenger cars and 33,521 were trucks. Truck output, in a decline since last September, made its initial recovery. Manufacture of passenger cars in the United States alone amounted to 140,326 units, compared with 124,173 in December. In January, 1930, the United States made 236,193 passenger cars. Current estimates for February indicate that further gains were made in the rate, but comparison with the usual seasonal upturn must await actual figures.

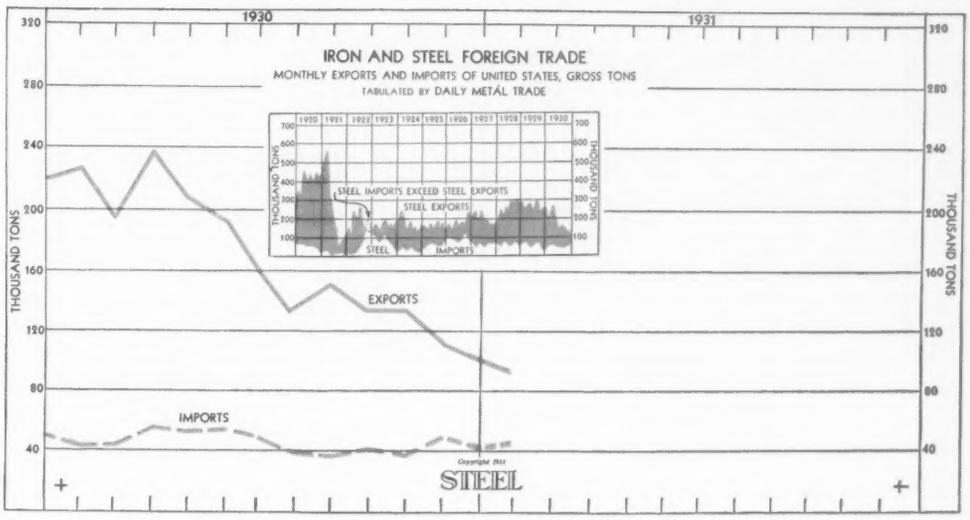
Passenger Cars

	1931	1930
Jan.	144,878	254,049
	1930	**1929**
Dec.	128,295	96,920
Nov.	106,494	176,629
Oct.	116,006	328,305

Trucks

	1931	1930
Jan.	33,521	38,557
	1930	**1929**
Dec.	32,928	28,582
Nov.	34,665	50,368
Oct.	38,579	66,235





Exports

	Tons
Jan., 1931	92,745
Dec., 1930	101,988
Jan., 1930	225,090

Imports

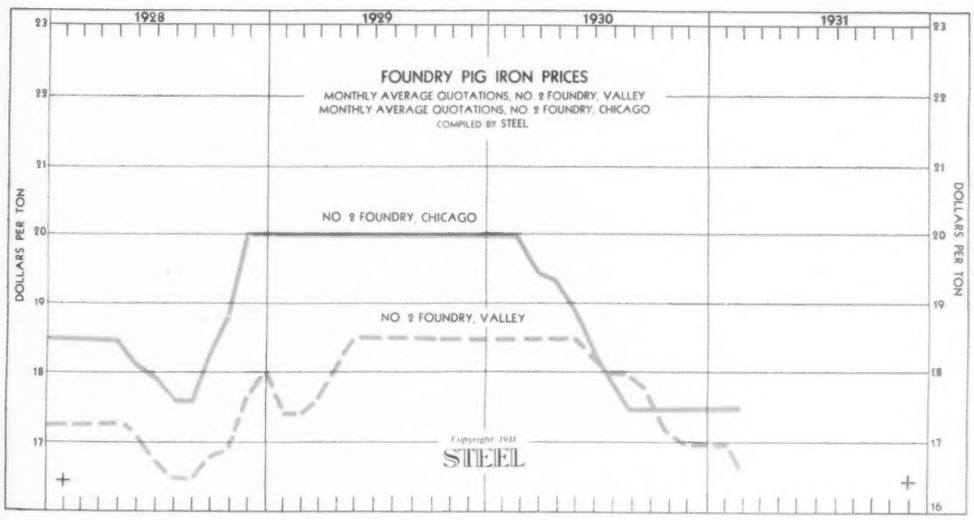
Jan., 1931	40,781
Dec., 1930	40,754
Jan., 1930	42,314

Iron and Steel Imports Hold Steady as Exports Continue Decline

January exports of iron and steel met with substantial losses, while imports held at the same level. A total of 92,745 tons shipped out of the country compares with 101,988 tons in December and 225,090 tons in January of 1930. January imports, at 40,781 tons, were just 27 tons above the figure for December, and only 1533 tons under imports of a year previous. Since reaching a 1930 peak at 238,333 tons in March, iron and steel exports have dropped off sharply, interrupted only by a single rise in August and a sustained level in October. Meanwhile imports, marked particularly in recent months by shipments of pig iron, have held at about the same general rate.

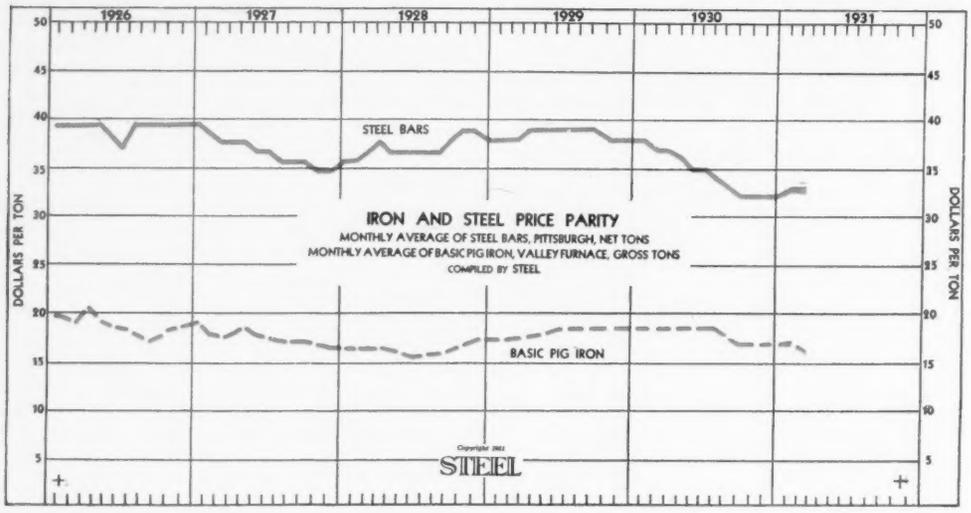
Foundry Pig Iron Prices Spread as Valley Quotation Drops

Foundry pig iron quotations spread slightly in February when a reduction was brought about in the valley. The price of No. 2 foundry, Chicago, exhibited steadiness and firmness throughout the month at $17.50, the quotation established last August. Releases in this district were better than sales. The valley price for No. 2 foundry, accompanied by that in the Pittsburgh market, dropped in the middle of the month from $17 to $16.50, resulting in a small decrease in the monthly average. The $17 price had been nominal for some time and the present readjustment is due to the fact that the lower figure, after having been manifested previously, has just become quotable.



Monthly Averages

	No. 2 Foundry Chicago	Valley
Feb., 1931	$17.50	$16.75
Jan., 1931	17.50	17.00
Dec., 1930	17.50	17.00
Nov., 1930	17.50	17.00
Oct., 1930	17.50	17.20
Sept., 1930	17.50	17.87



Steel Bars

	1931	1930
Feb.	$33.00	$37.00
Jan.	33.00	38.00
	1930	**1929**
Dec.	32.00	38.00
Nov.	32.00	38.00
Oct.	32.00	38.00

Basic Pig Iron

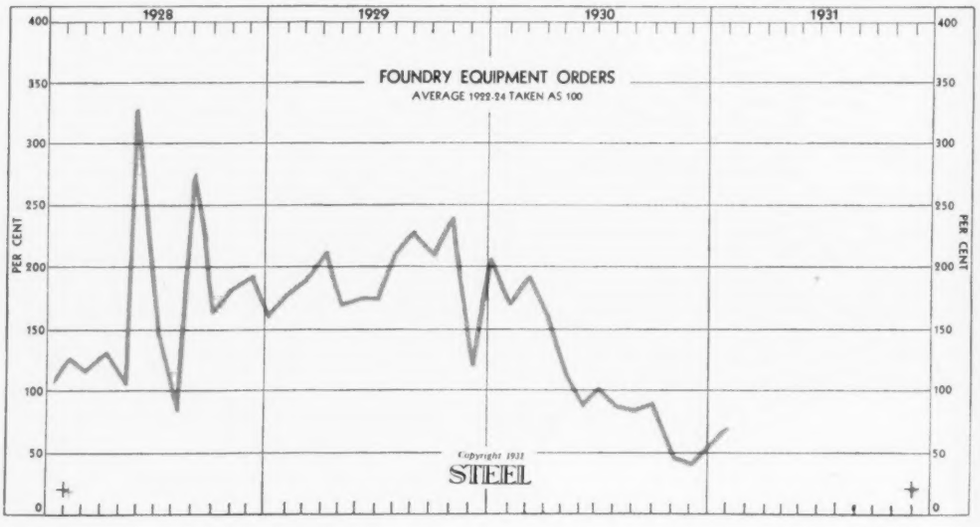
	1931	1930
Feb.	$16.75	$18.50
Jan.	17.00	18.50
	1930	**1929**
Dec.	17.00	18.50
Nov.	17.00	18.50
Oct.	17.00	18.50

Basic Pig Iron Quotation Revised Downward in February

As steel bar quotations maintained their January gain through February, pig iron, which previously had been unchanged, turned in the opposite direction and lost a step. Steel bars, Pittsburgh, were quotable at $33 on new business during the month, although activity was mild. Basic pig iron, valley furnace, had a monthly average of $16.75 as compared with the average of nominal quotations, $17, in January. The pig iron figure is the lowest since September, 1928, at which time a monthly average of $16.10 marked the upward swing which preceded 1929 prices. The reduction in mid-February affected not only basic, but also No. 2 foundry.

Foundry Equipment Orders at Best Rate Since Last September

New orders for foundry equipment increased moderately in January and reached the best position they have held since last September. Since the low of 45.3, the index for November, a gain brought the figure to 59.8 in December, and another gain to 65.3 in January. Bookings still are abnormally low, as shown in comparison with the index of 160.1 for January, 1930 and 180.5 for January two years ago. A marked drop in shipments from 102.6 in the previous month to 54.69 in January had a decided effect upon unfilled orders, which gained during the period from an index of 82.3 to an index of 94.6. Unfilled orders a year ago stood at 295.6, and at 336.1 two years ago.



Per Cent

	1931	1930
January	65.3	160.1
	1930	**1929**
December	59.8	208.0
November	45.3	128.6
October	50.0	245.3
September	91.0	216.3
August	85.2	229.5

Magnetic Testing of Pipe Welds Is New Inspection Method

BY H. R. SIMONDS
Associate Editor, STEEL

WHEREVER utmost assurance is desired covering the quality of a weld, some form of nondestructive test is almost indispensable. High-pressure boiler work, pressure vessels in the chemical industry and superheated steam lines come in this category and in most cases field testing of welds is necessary. In the case of a large steam generating plant in Maryland some months ago, pipe fittings were tested thoroughly in the field by portable X-ray equipment set up for the job. Recently the Ferrous Magnetic Corp., New York, designed and built a portable magnetic testing outfit and conducted a series of field tests of welds in a liquid supply line.

The pipe in this case was seamless cold-rolled steel pipe with carbon content about 0.20 per cent and with diameters of 4, 6 and 8 inches. The pipe was joined by gas welding in the field and in service was subjected to 750 pounds pressure at about 700 degrees Fahr. The Ferrous Magnetic Corp. was asked to do two things; first, to set up control practice with the idea of increasing the quality of welds, and second to test each weld in the field after the pipe was actually in place for service and supervise the repair of defective welds.

Samples of the pipe used and the different types of welds made at the start of the actual job were sent to the company's laboratory in New York. This laboratory is one of the most complete steel investigating plants in the country. Equipment includes modern magnetic and X-ray testing machinery, an electric furnace for heat treating specimens, all of the usual stress and impact testing machines, complete equipment for photomicrography, and milling machines and grinders for preparing

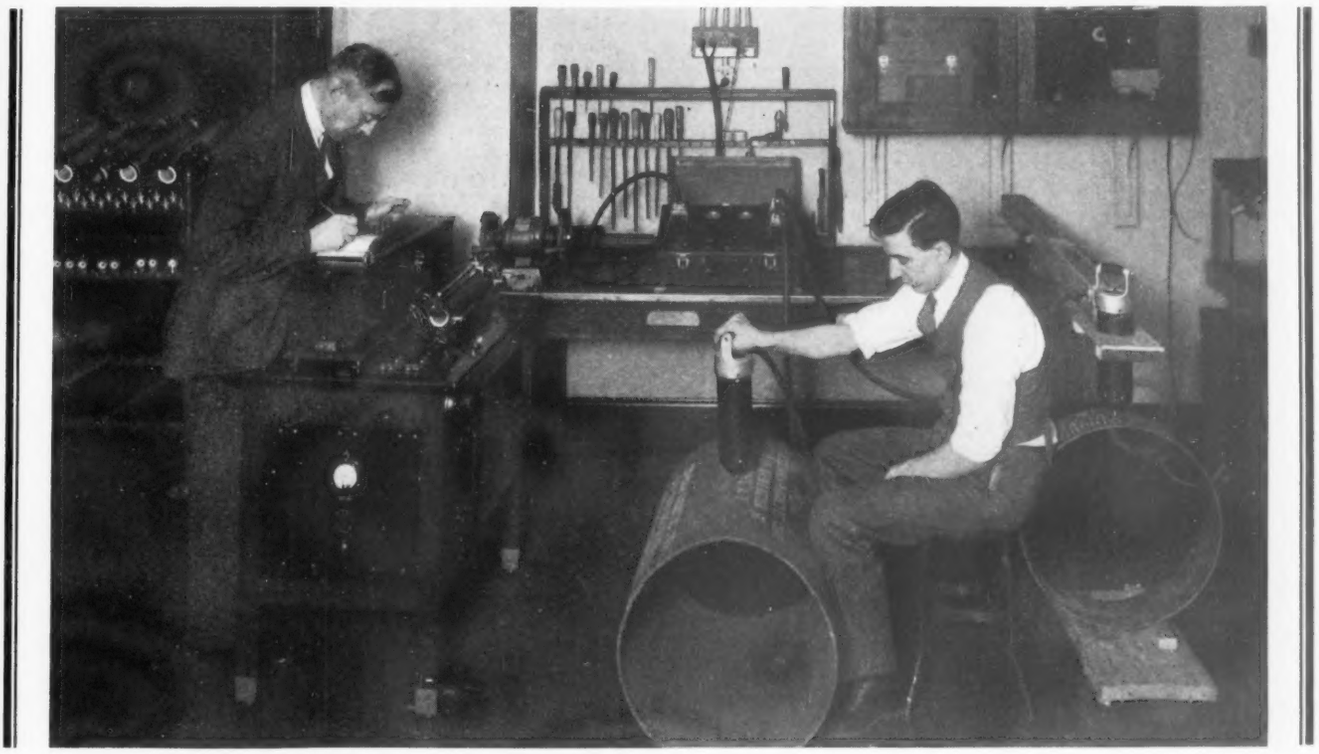


Fig. 1—Performing a magnetic test on a section of welded pipe in the laboratory. Two magnets are shown, one held permanently on a standard and the other moved to different points along the weld under test. The oscillogram which is being watched by the operator standing shows a comparison between the standard and the test specimen

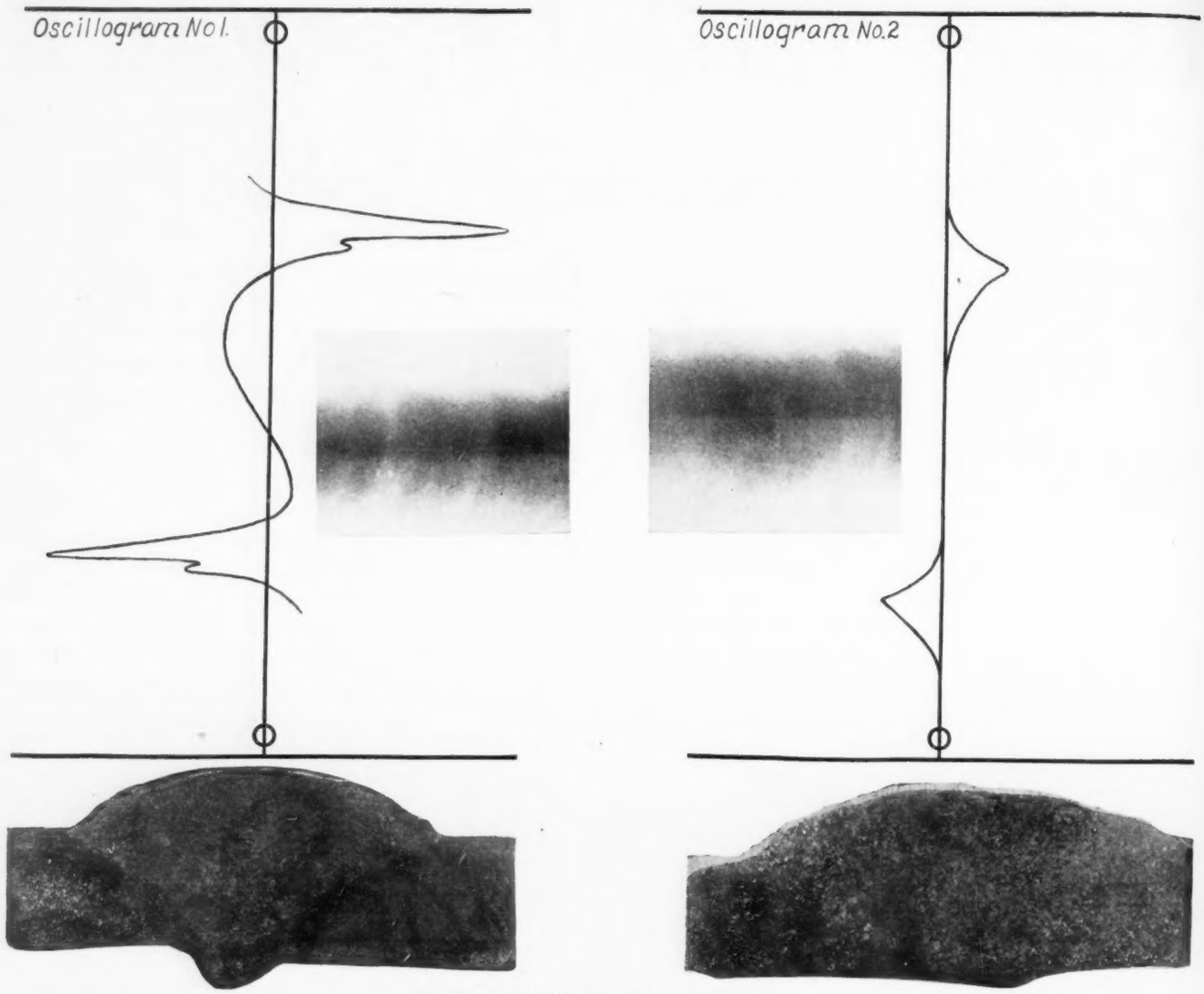


FIG 2 (Left)—Combination of oscillogram, X-ray photograph and macrograph. X-ray shows sound metal but contains white spots indicating gas pockets. Macrograph shows discontinuities within an area of sound metal. Oscillogram, made without filter, shows nodial peaks and double harmonic, indicating oxidation of welds, blow holes and gas pockets. Fig. 3 (Right)—X-ray shows normal density, as does the macrograph. Oscillogram, with filter neutralizing oxidation effects, shows normal conditions

specimens for subsequent metallographic examination.

When the specimens of welded pipe were received the first procedure was to make an exhaustive investigation to determine the relation between oscillograms produced by the magnetic testing device and other properties as determined by X-ray analysis, physical tests and photomicrographs. It soon was found that all the oscillograms showed peculiar nodial peaks which were independent of the quality of the weld. This peculiarity was found to be due to oxidation and accordingly a filter was built to eliminate peaks from the oscillograms.

Oscillograms Explained

Oscillogram No. 1 shows a normal specimen without the filter and oscillogram No. 2 shows this same specimen with the use of the filter. The field outfit was built with the filter incorporated so that it would show up defects in the weld itself without other complicating factors. Oscillogram No. 3 shows a defect as indicated by the field outfit. Oscillogram No. 4 shows a good weld but indicates magnetic leakage due to seams in the pipe adjacent to the welded area.

The laboratory examination preceding the field work was unusually exhaustive. The method of making the X-ray pictures is shown in the sketch of Fig. 6. The circumference of the pipe at the weld was divided into 12 sections and overlapping exposures where made as indicated, care being taken to record each exposure in relation to the actual area explored.

The method of performing magnetic tests in the laboratory is shown in the illustration on Page 39. The man seated is holding one magnet at various points on the weld which is being investigated, while the man at the instrument is watching the oscillograms and making notations covering indicated characteristics. The second magnet in position on the standard used for comparison is shown at the right.

Photomicrographs were obtained by cutting a cylindrical section extending 1 inch each side of the weld and dividing this into transverse strips, each approximately 1 inch wide. The surfaces of these strips were ground, given a hot hydrochloric acid etch and then photographed.

Tabulations Permit Comparisons

Results of the different methods of investigation were tabulated so that the characteristics of the oscillogram at any point could be studied with reference to the X-ray and the actual photomicrograph at that same point. After much study the investigators felt confident that with the magnetic testing equipment which they had built for the field work, a definite oscillogram characteristic would indicate definite and well understood properties in the weld at the point of investigation.

The field work as stated consisted not only of making tests and repairs,

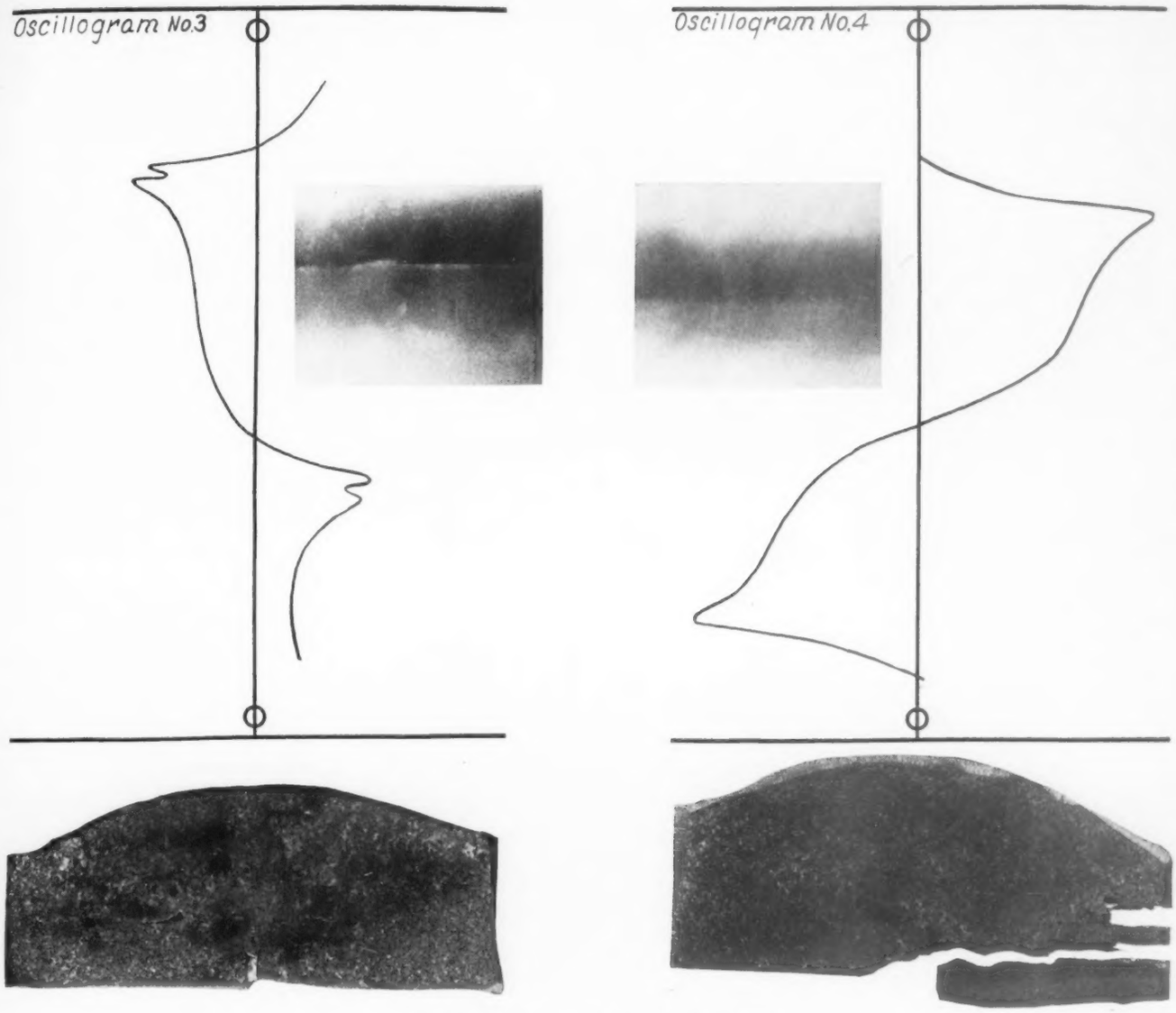


FIG 4 (Left)—X-ray shows white line indicating open weld and white specks indicating gas pockets. Macrograph reveals these discontinuities. Oscillogram, made with filter, indicates to experienced investigator the presence of gas pockets and absence of fusion. Fig. 5 (Right)—Oscillogram here shows a peculiar condition, interpreted as high magnetic leakage due to seams in the pipe entering the welding zone. Macrograph confirms this seamy condition but the X-ray fails to show the seams as they are transverse to the direction of examination

but of studying welding procedure with the individual welders and the magnetic testing apparatus to the end that a better technique was developed and the percentage of defective work reduced. Welds in the field were 100 per cent magnetic tested and each was marked as to its nature. Particularly bad specimens were cut out and short pipe sections set in with two new welds. Other welds were repaired by slowly reheating and allowing the metal to flow and fill voids. After repairing, further magnetic tests were made.

Determine Cause of Defects

It was soon learned that many of the weld defects appeared at the point where the ring of the weld was completed, that is, where the hot metal being deposited at the end of the weld met the cold metal deposited at the start. This difficulty was overcome by requiring the welders to overlap the start of the weld at the time of finishing by a distance of 1 inch or more.

Pipes in the field were joined with a slight offset and the weld was wider on top than on the bottom, due to the difficulty of application of the torch and weld material. A typical field weld is shown in the sketch *A* in Fig. 8. The arrows *C-C* indicate the position for the detection of structural defects. A special magnetic test was made on the pipe away from the weld, for the comparison of the pipe material with the weld material. The points where magnetic tests were made coincided with the other tests. Sketch *B* of Fig. 8 shows a longitudinal cut through the weld with 12 points for tests indicated. A graphic representation of conditions at some of these 12 points is shown in Figs. 7 and 9.

The letters noted in sketch *B* of Fig. 8 are defects of different types as follows: *A*—burnt pipe metal; *B*—burnt metal and additional voids; *C*—no fusion; *D*—stick-weld to left side of weld; *E*—stick-weld to right side of weld; and *F*—voids in weld metal.

Oscillograms Reveal Structures

An example of the comparison of structure and oscillograms is shown in Figs. 2 to 5. Fig. 2 shows an oscillogram with a nodial peak indicating oxidation of weld and a double harmonic indicating blow holes or gas pockets. The corresponding X-ray shows sound metal with white spots indicating gas pockets and the photomicrograph also indicates gas pockets and blow holes. In Fig. 3 the oscillogram shows a normal density with slight oxidation and this is confirmed by both the X-ray and photomicrograph.

In Fig. 4 the oscillogram indicates gas pockets and no fusion at the bot-

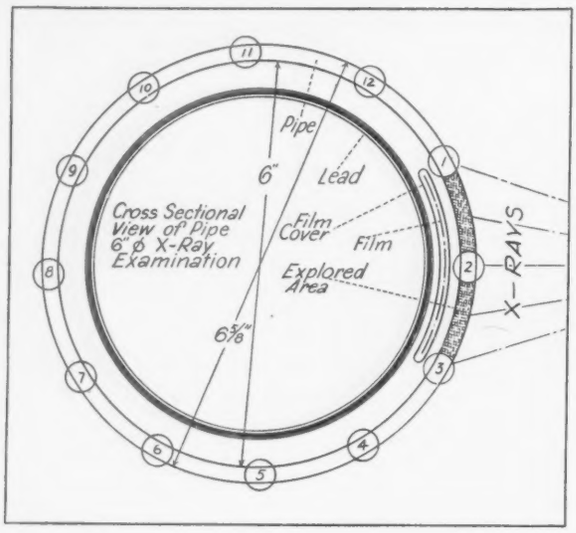


FIG 6—Diagrammatic cross section through the weld of a 6-inch pipe, indicating the method of making X-ray examination. The circled figures are used to locate the various test areas when the X-ray photographs have been taken

tom of the weld. The X-ray contains a white line which indicates an open weld at the bottom and also contains tiny specks which indicate gas pockets. The photomicrograph clearly shows an open weld at the bottom and confirms the presence of gas pockets. In Fig. 5 the oscillogram has a high magnetic leakage due to seams in the pipe entering the welding zone. In this case the X-ray did not reveal these seams inasmuch as they were transverse to the direction of examination but the photomicrograph clearly shows the seamy nature of the pipe.

Fig. 7 shows sketches of various characteristics of weld sections. *A* represents coarse grain and part of a stick-weld. *B* also shows coarse grain and a full stick-weld, exhibiting low tensile strength. *C* has coarse crystalline structure with secondary fusion on beveled ends of the pipe resulting in a layer of fine crystal structure but retraction of the metal; also low tensile strength. *D* shows burnt pipe ends with coarse structure but moderate to high tensile strength. The weld would be rejected. *E* shows a condition where some of the pipe metal has been separated and is enclosed by a weld metal deposit. This weld also would be rejected.

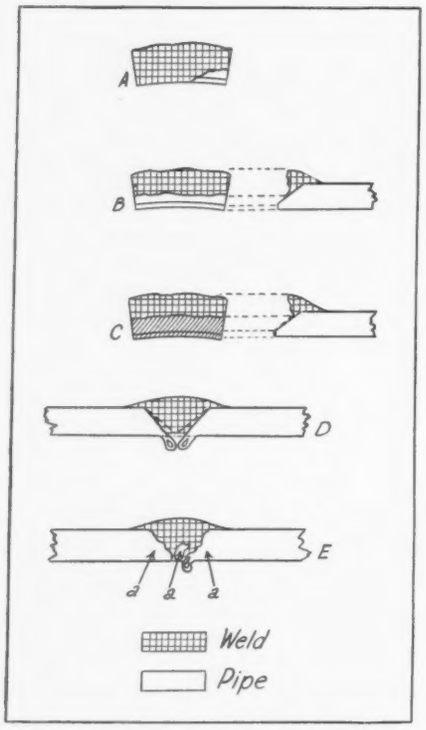


Fig. 7—Characteristics of various weld sections and structures

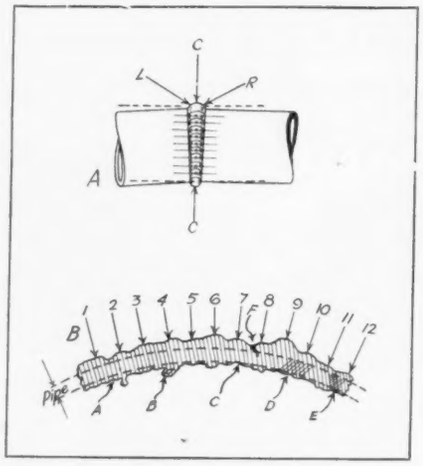


Fig. 8—Sketch A shows pipe welded in the field, the arrows showing position for detection of structural defects. Sketch B is a section through a weld, points 1 to 12 indicating magnetic test positions and points A, B, C, D, E and F showing positions of defects

Fig. 9 illustrates by sketches various types of weld defects, as revealed by examination. *A* indicates fine grain on top and bottom of the weld with a coarse crystalline structure throughout the center. A low to moderate tensile strength results. *B* shows fine grain but with coarse grain intermixed. Structural brittleness results in a low tensile strength. *C* indicates a coarse crystalline structure with normal to high tensile strength. Voids in the center of the weld do not seem to influence the tensile strength greatly. However, the weld would be rejected due to stresses and properties promoting corrosion.

In *D* the pipe ends are burnt, with no intimate contact and voids present in the weld metal. A low to moderate tensile strength is shown. *E* indicates a coarse crystalline structure throughout. The sketch is a longitudinal cut through the weld at the point where the end of the weld joins the cold metal at the start of the welding operation. Arrows indicate direction of welding around the pipe.

Concrete Reinforcing Steel Institute to Meet

Announcement has been made of the seventh annual meeting of the Concrete Reinforcing Steel institute, to be held at Edgewater Gulf hotel, Biloxi, Miss., March 16-18. The seventh annual golf tournament will be played on the Edgewater Gulf hotel course, Wednesday afternoon, March 18. Included in the technical program are the following papers:

"Tall Reinforced Concrete Buildings," by Frank E. Brown, Smith & Brown, consulting engineers, Chicago.

"Reinforcing Steel in Concrete Pavements," by Clifford Older, consulting engineer, Chicago.

"The Mill Viewpoint," by Robert Gregg, president, Atlantic Steel Co., Atlanta, Ga.

"The Bridge Builder," by Hon. Leon McCord, judge of circuit court, Montgomery, Ala.

"Credit in the Building Industries," by W. H. Pouch, president, Concrete Steel Co., New York.

"Trade Practice Conference Rules," consisting of progress reports from various territories.

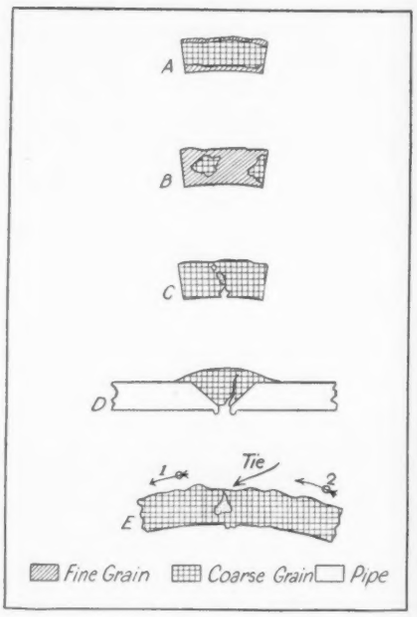
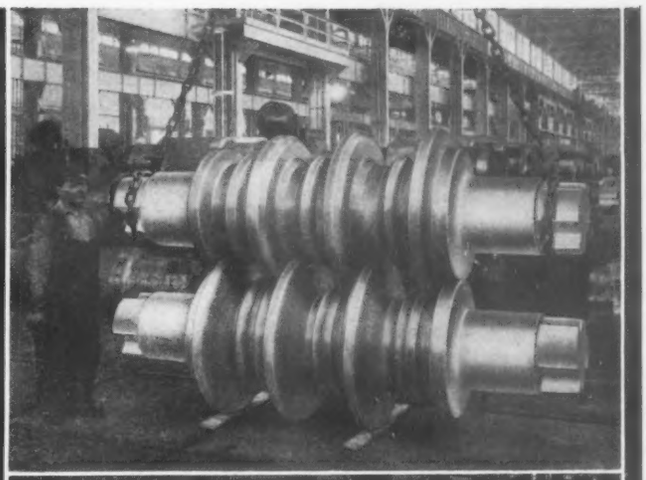
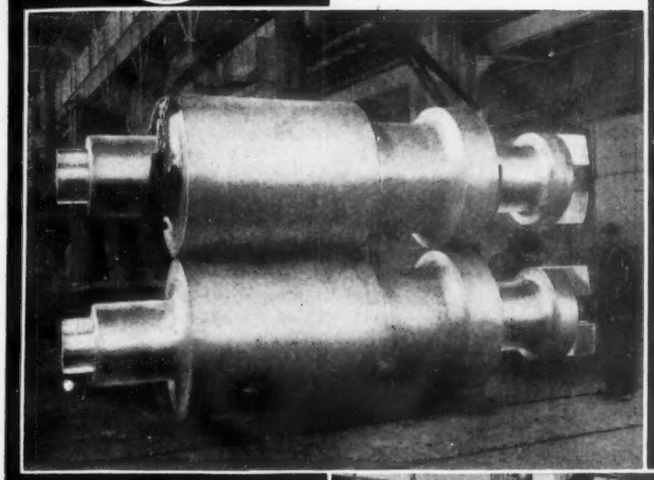
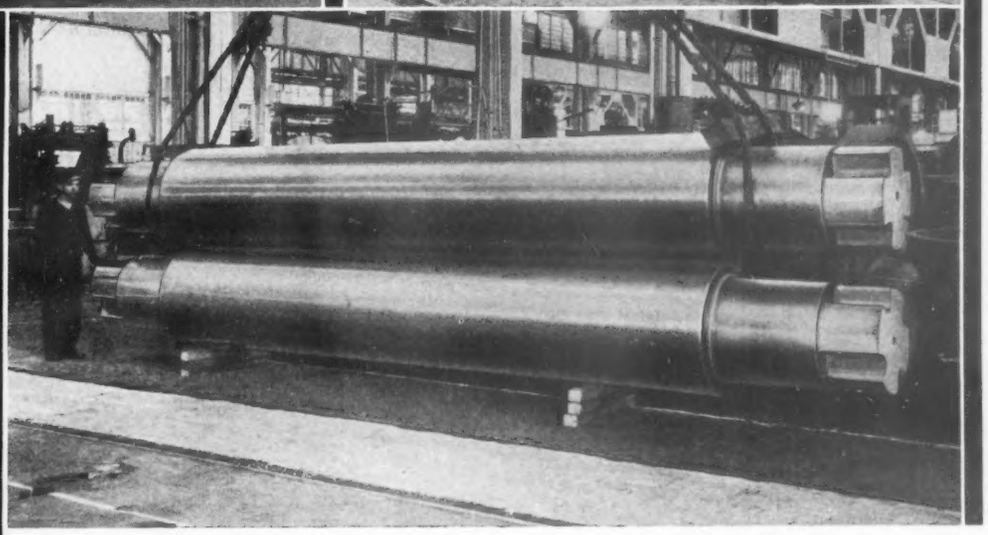


Fig. 9—Various types of defects in welds as determined by examination

ROLLS







"MESTA Special"

Alloy Steel Rolls

Carbon Steel Rolls

Chilled Iron Rolls

Fine Grain Iron Rolls

Alloy Iron Rolls

Sand Iron Rolls

MESTA MACHINE COMPANY

Pittsburgh, Penna., U. S. A.

Mesta

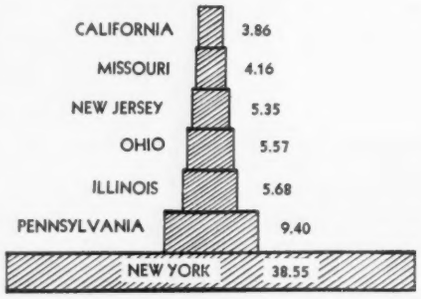
Metropolitan New York Largest Shape User Last Half 1930

BY W. H. LLOYD
Associate Editor, STEEL

METROPOLITAN New York territory continued almost insatiable in its demand for structural steel in the last half of 1930. States of New York and New Jersey accounted for 43.90 per cent of shapes awarded in that period, based on weekly compilations by STEEL, which do not take into account awards of less than 100 tons at a time. Those two states took 51.29 per cent in the last half of 1929.

As shown in Table I, page 44, New York state alone consumed 38.55 per cent in the last half of 1930, against 46.19 per cent in the comparable period of 1929. Comparisons on a tonnage basis are shown in table V, page 48.

It is evident that a large number of small jobs were let in 1930's last half period; while 48 more separate jobs were reported in that period, or 1092 against 1048 for the same period 1929, nevertheless total tonnage awarded dropped off 154,984 tons from 1,019,875 to 864,891 tons. STEEL's reports for the first half of 1930 aggregated 916,299 tons, which added to 864,891 for the last half gives a total for the year of 1,781,190 or 66.8 per cent of the total as reported by United States department of commerce, ie., 2,699,480 tons, which takes into account all work let including jobs taking 1 to 99 tons at a time inclusive. STEEL's reports start at 100 tons. Since Iron Trade Review's aggregate in 1929 represented but 55 per cent of the total reported to the government and this year's analysis accounts for 66.8 per cent, a constantly improving coverage by this publication is shown.



The largest individual week was the one reported in the issue of July 17, when 56,757 tons was awarded. In the last half of 1929 the peak week was that of Dec. 19 when the aggregate tonnage let was 92,030 tons.

Reference to Table III, page 48 shows that whereas commercial, residential and industrial types of construction dropped off in the last half of 1930 compared with a similar period the preceding year, engineering and public building work increased. This would partially indicate the cumulative effect of concerted effort to stem the gradually mounting tide of unemployment by stimulating those types of construction.

For instance, whereas commercial building dropped from 304,595 tons in the last half of 1929 to 230,303 tons in the last half of 1930, engineering work increased from 260,540 to 323,886 tons. Whereas industrial work declined from 181,723 to 84,504 tons, public building work increased from 99,264 to 123,339 tons. By the same token, i.e., depression, unemployment, etc., residential types of buildings declined from 168,814 tons in the last half of 1929 to 100,538 tons in the last half of 1930.

Table IV shows that of a total of 332,968 tons for New York state, New York city and environs, exclusive of northern New Jersey points, took 299,565 tons or 34.63 per cent of the total lettings for the United States. Philadelphia was second, although not close, at 45,445 tons or 5.25 per cent.

Included in the New York city tonnage was 107,260 tons of commercial buildings, 92,843 tons of residential,

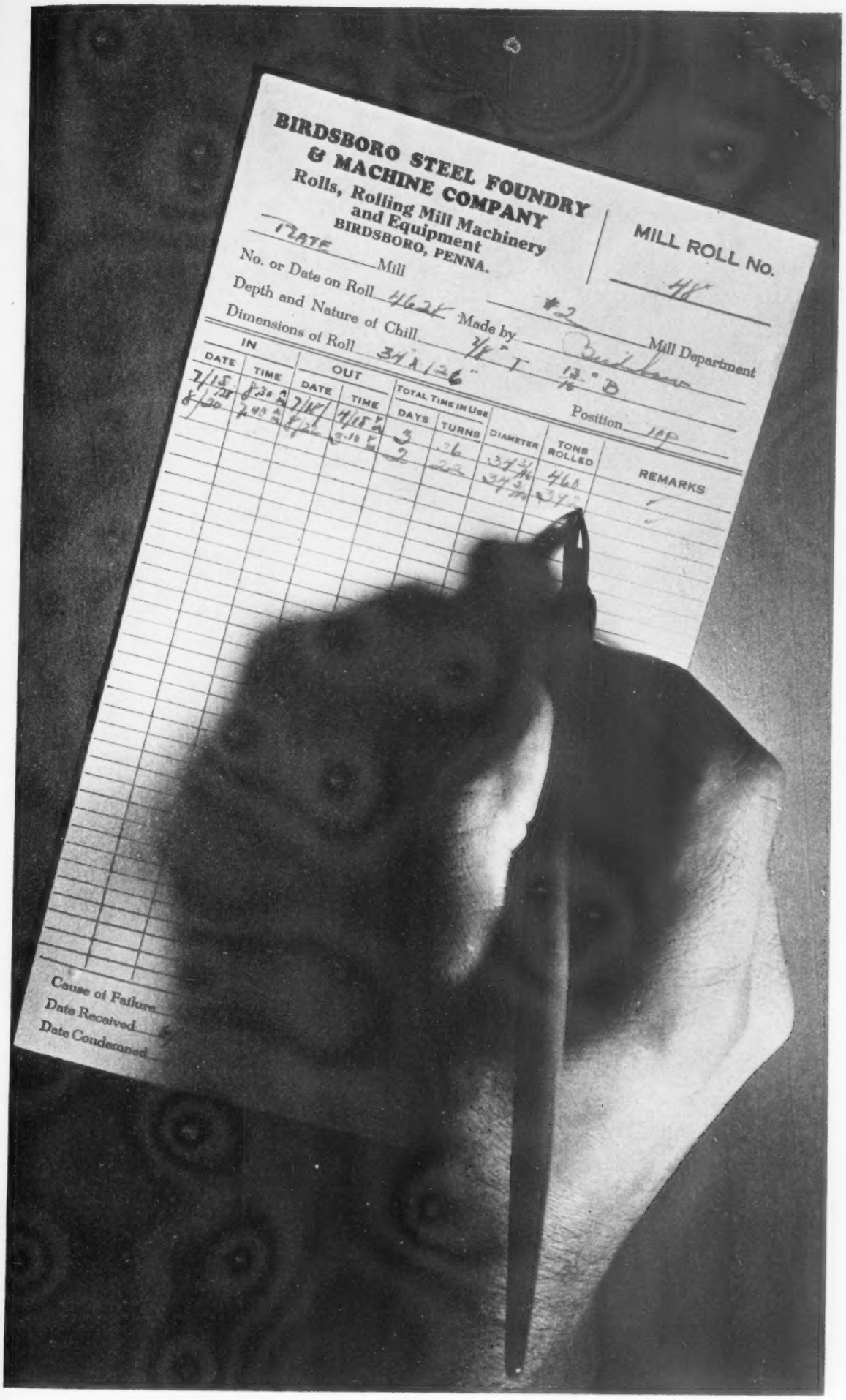
Table I

Percentage of Awards by States

	Last Half 1930	Last Half 1929
New York	38.55	46.19
Pennsylvania	9.40	8.31
Illinois	5.68	7.98
Ohio	5.57	3.80
New Jersey	5.35	5.10
Missouri	4.16	1.67
California	3.86	2.84
Kentucky	3.11	.07
Massachusetts	2.43	1.98
Indiana	2.04	1.76
Washington	2.02	.84
Michigan	1.68	3.35
West Virginia	1.50	.60
Unlocated R.R. Work	1.43	2.53
Connecticut	1.26	1.03
Oklahoma	1.14	1.02
Maryland	1.09	.66
Virginia	.66	.59
Alabama	.62	.33
Wisconsin	.56	1.42
District of Columbia	1.08	.00
Maine	.89	.37
Texas	.93	.68
Louisiana	.70	.59
All other states	4.29	6.29
Total	100%	100%

Wide World Photo

RECENTLY opened for occupancy, this 32-story corner-window office building in New York, marks a new step in building construction, and a further addition to the innumerable piles of steel and masonry in Manhattan



it's
. . .
the
. . .
tonnage
. . .
column
. . .
that
. . .
impresses
. . .
the
. . .
buyer
. . .
with
. . .
Birdsboro
. . .
rolls

Table II

Distribution by States According to Use

	Commercial		Residential		Industrial		Engineering		Public Bldgs.	
	No. of Projects	Tons	No. of Projects	Tons	No. of Projects	Tons	No. of Projects	Tons	No. of Projects	Tons
Alabama	2	825	..	..	7	2,750	1	1,600	1	175
Arizona	1	900	..	..	1	350	2	505	..	..
Arkansas	..	..	..	..	..	..	3	1,100	1	400
California	28	15,906	8	1,671	15	12,396	6	1,506	7	1,910
Colorado	..	..	..	..	..	..	1	200	1	400
Connecticut	8	4,175	..	..	1	152	1	125	7	6,505
Delaware	..	..	..	..	2	225	..	..	..	..
Dist. of Col.	1	3,100	..	..	..	..	..	..	6	6,321
Florida	2	300	..	..	1	300	..	..	..	..
Georgia	3	1,575	..	..	..	..	2	1,040	1	480
Idaho	..	..	..	..	2	230	..	..	..	..
Illinois	12	5,315	..	..	7	4,300	21	16,547	23	22,976
Indiana	2	455	..	..	6	7,300	3	9,520	1	400
Iowa	3	1,750	..	..	..	..	2	1,900	..	..
Kansas	1	150	..	..	..	..	..	..	1	1,075
Kentucky	1	150	..	..	2	3,150	15	23,629	..	..
Louisiana	3	415	..	..	2	400	6	4,000	5	1,257
Maine	1	120	..	..	1	150	10	7,377	1	100
Maryland	5	1,445	2	1,850	3	1,365	11	3,430	6	1,365
Massachusetts	12	5,480	1	170	7	2,896	18	6,984	18	5,511
Michigan	8	2,837	1	350	5	3,150	8	7,540	4	700
Minnesota	1	125	..	..	4	4,200	8	3,476	..	..
Mississippi	1	150	..	..	..	..	..	..	..	..
Missouri	5	16,835	..	..	4	4,921	11	12,530	4	1,650
Montana	..	..	..	..	..	..	..	..	..	..
Nebraska	3	661	..	..	..	..	5	3,284	..	..
Nevada	..	..	..	..	..	..	..	..	..	..
New Mexico	..	..	..	..	..	..	..	..	2	550
New Hampshire	..	..	..	..	1	180	4	885	1	156
New Jersey	12	7,976	2	1,714	14	4,293	17	27,525	16	4,822
New York	94	113,456	112	93,808	15	7,860	49	77,180	57	40,664
North Carolina	..	..	..	..	1	325	..	..	1	120
North Dakota	..	..	..	..	..	..	..	..	..	..
Ohio	17	11,025	1	143	7	1,610	8	20,557	17	15,845
Oklahoma	5	5,530	..	..	2	826	3	2,300	2	1,202
Oregon	..	..	..	..	..	..	1	400	..	..
Pennsylvania	20	22,805	2	326	16	8,672	39	45,084	16	4,415
Rhode Island	..	..	1	131	1	360	..	..	1	105
South Carolina	..	..	..	..	..	..	1	210	..	..
South Dakota	..	..	..	..	..	..	2	975	..	..
Tennessee	..	..	..	..	1	300	3	1,065	1	400
Texas	8	3,950	..	..	3	765	7	2,038	4	1,260
Utah	..	..	..	..	..	..	..	..	2	500
Vermont	1	170	..	..	1	225	..	..	..	..
Virginia	1	100	3	375	2	500	4	2,780	4	1,950
Washington	7	2,322	..	..	10	3,030	11	11,839	1	300
West Virginia	..	..	..	..	4	2,728	8	10,270	..	..
Wisconsin	1	300	..	..	5	2,395	3	1,310	3	825
Wyoming	..	..	..	..	..	..	1	800	..	..
Unlocated R.R. wk.	..	..	..	..	2	2,200	19	12,375	..	..
Total	269	230,303	133	100,538	155	84,504	314	323,886	215	123,339
Exports	1	300	..	..	3	741	2	1,280	..	..
Total	270	230,603	133	100,538	158	85,245	316	325,166	215	123,339
Canada	2	9,200	..	..	12	21,280	17	23,075	2	900
Grand Total	272	239,803	133	100,538	170	106,525	333	348,241	217	124,239

mostly apartments taking from 100 to 6800 tons at a time, 1615 tons of industrial work, 67,647 tons of engineering work, representing mostly subways and 30,200 tons of public buildings. Of that 30,200 tons, 7800 tons went into the technical high school at Brooklyn and 6500 tons into the Rikers Island, N. Y., penitentiary.

Other large structures in the public building classification included a 5300-ton technical high school at Chicago, 4300-ton office building at Washington, 4200-ton stadium at Cleveland and 3500-ton state office building at Columbus, O.

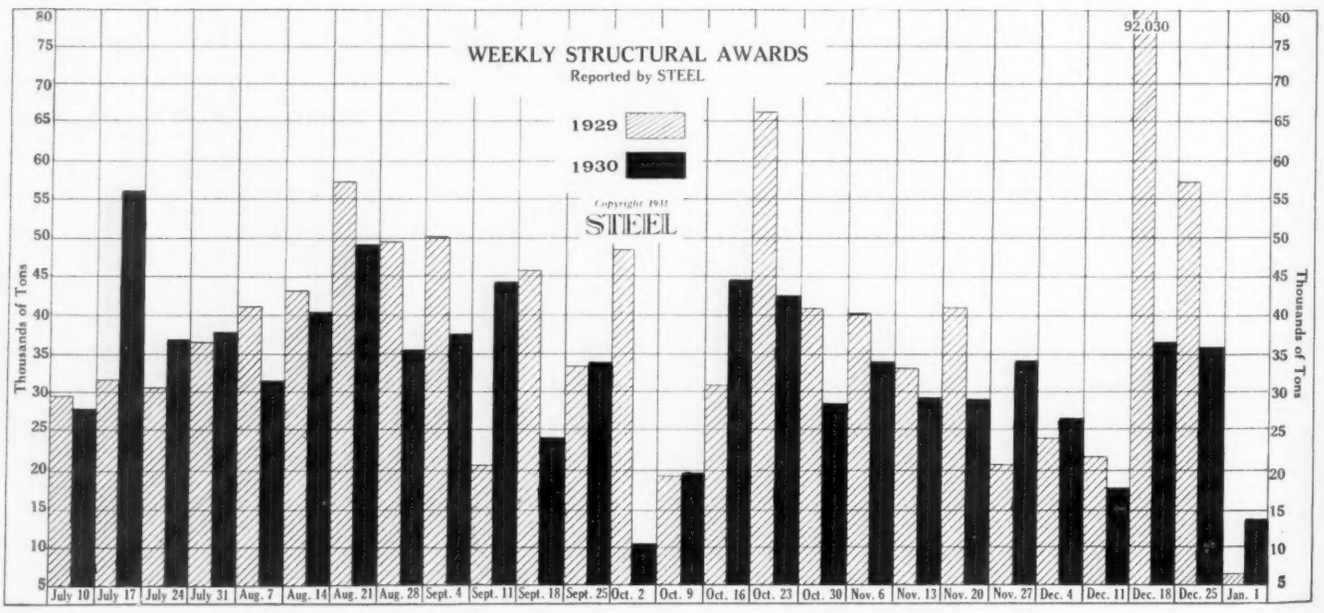
The largest individual industrial expansion was by Henry Ford, assembly plants for Ford Motor Co., being erected at Richmond, Long Beach and Maywood, Calif., and Buffalo, taking 3800, 600, 2000 and 4325 tons, respectively. The largest power plant installation was at Hammond, Ind., 5000 tons, and the next largest at Safe Harbor, Pa., 4340 tons.

Apartment House Tonnage Heavy

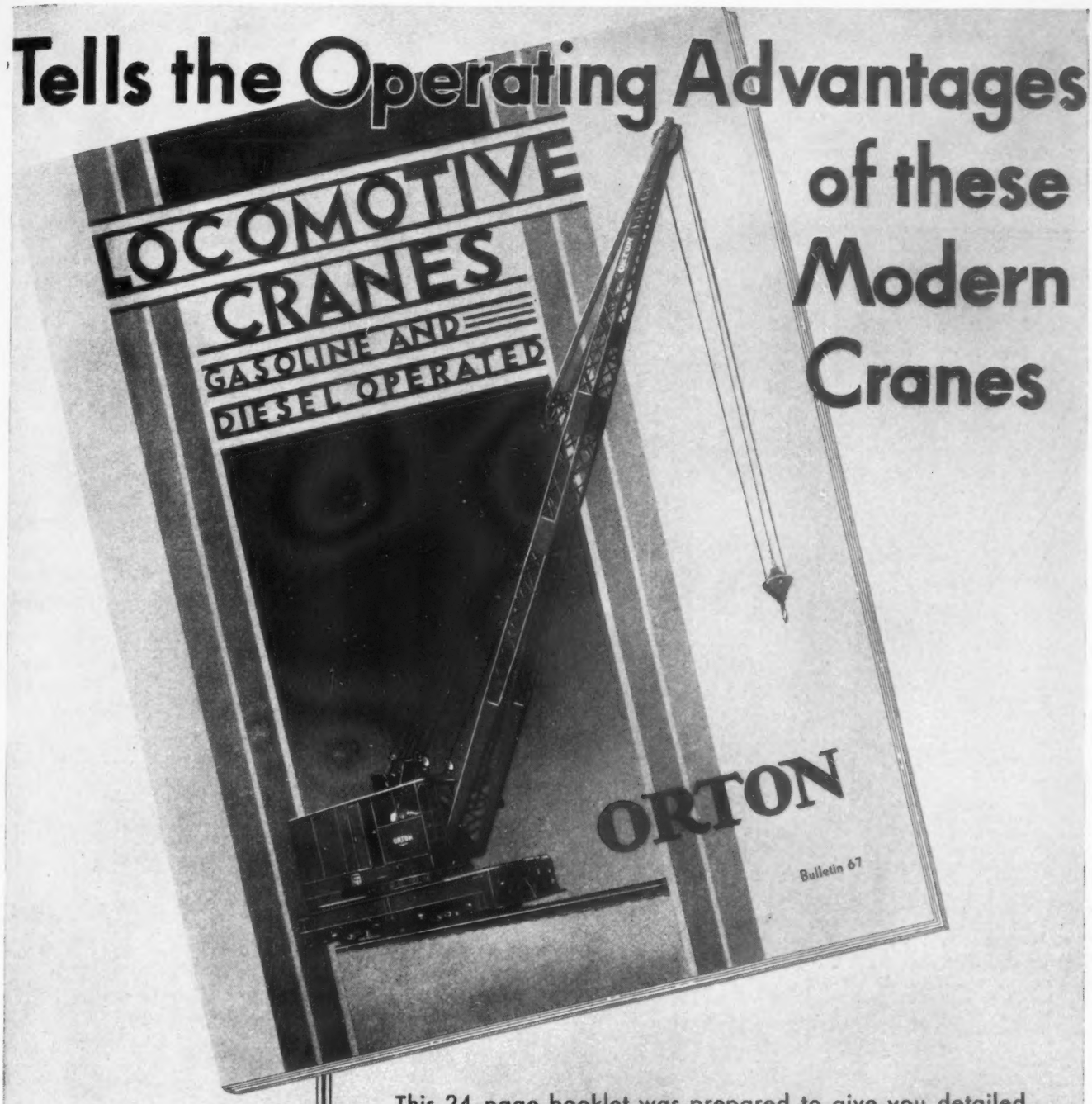
As already indicated, some of the largest attractive tonnages let in the East were for apartment houses in New York City, such as 6800, 6000, 4500 and 3800 tons. The nurses' home of the New York hospital took 6000 tons.

Among the largest commercial structures let during the last half of 1930 were a 15,000-ton warehouse for the Lehigh Valley railroad in New York, and a 13,500-ton telephone building there. Banks at Kansas City, Mo., Oklahoma City, Akla., and Philadelphia, took 4700, 4100 and 3100 tons, respectively. An office building at Kansas City took 6000 tons, while a terminal at St. Louis acounted for 5000 tons. Numerous office buildings were erected in New York City, including three taking 4000 tons apiece, one, 5000 tons, and four others, 5500, 7300, 7500 and 8000 tons, respectively.

In the engineering work class, the largest individual award comprised 14,820 tons for a New York subway. Other subways there involved 12,700, 9700, 7500, 5300 and 4350 tons, respectively, while subways at Philadelphia took 2800, 4300 and 5000 tons



Tells the Operating Advantages of these Modern Cranes



This 24-page booklet was prepared to give you detailed information on the operation of gasoline and Diesel locomotive cranes. It outlines the substantial savings made in labor required, in time and attendance, in the fuel used, and in maintenance. It also gives capacities of the various models, and indicates the sizes suitable for different classes of material handling.

These machines, pioneered by ORTON, are the result of years of experience in automotive application as well as crane manufacture, and each model represents a distinctive design, unified so that all of the numerous advantages of internal-combustion-engine operation are fully realized. Write for Bulletin 67.

In addition to a complete range of types and capacities, ORTON Cranes are made for many special-purpose applications.

ORTON Engineers are at your service to assist you in analyzing your material-handling requirements, in making plans and layouts, and in estimating the cost of the entire installation.

ORTON CRANE & SHOVEL CO.
608 S. Dearborn St., Chicago, Ill.
Representatives in Principal Cities
Special Railway Sales Representative: Thos. D. Crowley & Co., 8 S. Michigan Ave., Chicago

and an electric railway terminal subway at St. Louis, 6600 tons.

Perhaps the largest single bridge letting, i.e., 12,000 tons, took place at Cleveland, the Central-Lorain bridge, which went to Massillon Bridge & Structural Co. Several state bridges in Kentucky and West Virginia accounted for 20,000 tons or more, while one at Evansville, Ind., took 8275 tons. A 7500-ton bridge also was let at Seattle.

As revealed by Table IV, five cities took more tonnage in the last half of 1930 than in the same period 1929, and five took less. The former group includes Philadelphia, Cleveland, St. Louis, Los Angeles and San Francisco, while those cities which consumed less in the last half of 1930 are New York, Chicago, Pittsburgh, Boston and Detroit.

21 States Increase Consumption

Table V, showing consumption by states indicates that 21 states show increased awards in last half 1930 over last half 1929, while 25 states show fewer. Those showing more are Alabama, California, Connecticut, district of Columbia, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Missouri, New Mexico, New Hampshire, Ohio, South Dakota, Texas, Utah, Washington and West Virginia. Those which registered declines are: Arizona, Arkansas, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Michigan, Mississippi, Nebraska, New Jersey, New York, North Carolina, Oklahoma, Oregon, Pennsylvnia, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, Wisconsin and Wyoming. No awards were reported in Montana Nevada or North Dakota. Unlocated railroad work also was less, as were exports.

Exports numbered six in the last half of 1930 or 2321 tons, while in the last half of 1929 they numbered nine and totaled 4941 tons. The 1930 exports included a 300-ton Kress store in Honolulu, T. H., a 411-ton factory in Cuba, 430 tons for Canal Zone, a 1000-ton bridge in Philippine Islands and a 280-ton bridge in Domingo, Mexico.

Canada took 54,455 tons, comprised of 33 different lots. The largest jobs were an 8000-ton terminal at Montreal and a 7400-ton powerhouse project at Beauharnois, Que. The Canadian total included 9200 tons for commercial work, 21,280 tons for industrial, 23,075 tons for engineering and 900 tons for public buildings.

Table III

Distribution by Type

(In net tons)

	Last Half 1930	Last Half 1929
COMMERCIAL		
(No. of jobs)	269	258
Office bldgs.	126,739	137,498
Banks	30,589	50,660
Warehouses	21,302	8,691
Railroad stations	14,990	25,550
Theaters	12,332	4,696
Hospitals	8,089	34,220
Stores	7,680	20,425
Garages	6,038	12,910
Hangars, etc.	1,430	8,545
Miscellaneous	1,114	1,400
Total	230,303	304,595
*Percentage to total	26.7	29.8
RESIDENTIAL		
(No. of jobs)	140	101
Apartments	88,651	124,169
Homes	9,616	2,120
Hotels	2,271	42,525
Total	100,538	168,814
*Percentage to total	11.6	16.5
INDUSTRIAL		
(No. of jobs)	155	264
Factories	50,409	122,688
Power plants	23,565	39,985
Railroad shops	640	8,250
Transmission towers	7,690	7,950
Cars, car parts, etc.	2,200	2,850
Total	84,504	181,723
*Percentage to total	9.8	17.8
ENGINEERING WORK		
(No. of jobs)	314	267
Bridges, railroad	64,018	96,810
Bridges, city, county, state and private	162,308	90,525
Subways	76,690	69,320
Piers, etc.	20,870	3,885
Total	323,886	260,540
*Percentage to total	37.5	25.6
PUBLIC BLDGS.		
(No. of jobs)	215	142
Schools	66,714	47,389
City, county, state	29,885	24,362
Clubs, etc.	2,665	14,965
Churches	4,305	3,890
Fraternal bldgs.	1,000	3,275
Armories, stadiums	7,925	786
Jails, etc.	10,845	4,595
Total	123,339	99,264
*Percentage to total	14.2	9.8
EXPORTS		
(No. of jobs)	6	9
Various countries	2,321	4,941
*Percentage to total	0.2	0.5
*TOTAL	864,891	1,019,875
CANADA		
(No. of jobs)	33	27
Various kinds of work	54,455	28,560
Grand total	919,346	1,048,435

Table IV

Leading Cities Compared

	Last Half 1930 No. of Projects	Tons	Last Half 1929 No. of Projects	Tons
*New York	238	299,565	174	430,521
Philadelphia	35	45,445	31	44,455
Chicago	39	35,206	44	60,540
Cleveland	12	21,283	35	13,286
St. Louis	7	12,620	6	12,200
Pittsburgh	11	10,343	13	11,400
Los Angeles	16	8,745	12	7,582
Boston	15	8,247	17	10,822
San Francisco	13	6,567	21	6,365
Detroit	8	2,952	18	11,730
Total	394	450,973	371	608,901
**All others	698	413,918	677	410,974
Grand total	1,092	864,891	1,048	1,019,875

**Including exports.

*Metropolitan New York, including Long Island, but not New Jersey suburbs.

Apprentices Are Dined

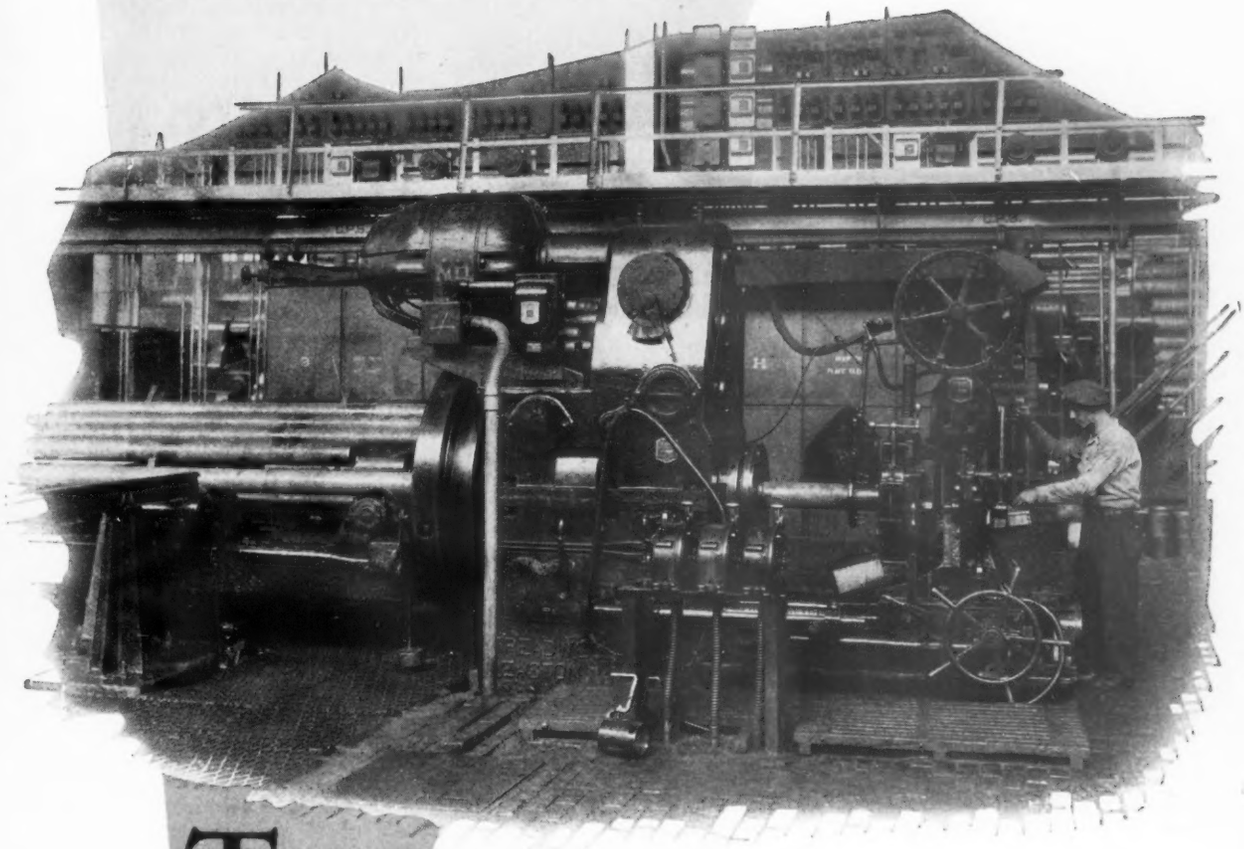
Approximately 475 apprentices and officials of machinery building plants attended the annual dinner given by the Milwaukee branch of the National Metal Trades association for apprentices who are in the last year of their course and those who have won awards during the past year in apprenticeship competition. Harold S. Falk, vice president and works manager, Falk Corp., Milwaukee, and chairman of the Metal Trades apprenticeship committee, was chairman.

Table V

Total Awards by States

	Last Half 1930 No. of Projects	Tons	Last Half 1929 No. of Projects	Tons
Alabama	11	5,350	11	3,435
Arizona	4	1,755	6	2,852
Arkansas	4	1,500	4	2,425
California	64	33,389	87	29,084
Colorado	2	600	3	2,425
Connecticut	17	10,957	13	10,561
Delaware	2	225	5	1,775
Dist. of C.	7	9,421	....	.....
Florida	3	600	3	875
Georgia	6	3,095	6	3,705
Idaho	2	230	1	257
Illinois	63	49,138	72	81,470
Indiana	12	17,675	28	17,971
Iowa	5	3,650	1	150
Kansas	2	1,225	1	600
Kentucky	18	26,929	1	800
Louisiana	16	6,072	8	6,000
Maine	13	7,747	3	3,865
Maryland	27	9,455	11	6,790
Mass.	56	21,041	57	20,295
Michigan	26	14,577	47	34,265
Minnesota	13	7,801	4	5,530
Mississippi	1	150	5	745
Missouri	24	35,936	14	17,080
Montana	0	....	0	....
Nebraska	8	3,945	6	5,750
Nevada	0	....	0	....
New Mexico	2	550	1	100
New Hamp.	6	1,221	5	632
New Jersey	61	46,330	39	52,038
New York	327	332,968	238	471,157
N. Carolina	2	445	12	2,870
N. Dakota	0	....	0	....
Ohio	50	48,180	64	38,816
Oklahoma	12	9,858	7	10,500
Oregon	1	400	12	12,430
Pennsylvania	93	81,302	102	84,849
Rhode Island	3	596	4	1,570
S. Carolina	1	210	2	1,050
S. Dakota	2	975	0	....
Tennessee	5	1,765	11	7,045
Texas	22	8,013	12	6,960
Utah	2	500	1	145
Vermont	2	395	5	2,850
Virginia	14	5,705	13	6,090
Washington	29	17,491	23	8,595
W. Virginia	12	12,998	12	6,175
Wisconsin	12	4,830	27	14,577
Wyoming	1	800	4	1,930
Unlocated R. R. Work	21	12,375	48	25,850
Exports	6	2,321	9	4,941
TOTAL	1092	864,891	1048	1,019,875

TREADWELL



Tube Threading and Cutting-off Machines

BEFORE purchasing tube threading and cutting-off machinery, send for the data which we have assembled from actual mill operating records covering many installations of Treadwell equipment.

These data give some illuminating facts relative to output, production costs and maintenance in large as well as small mills.

Copies are now available and will be sent to those interested on request.

Treadwell Engineering Company
Easton, Pa.

Rolling Mills—Threading & Cutting-Off Machinery—Special Machinery—Iron & Steel Castings

Strip Tempers Modified by Rolling After Annealing

BY JOSEPH S. ADELSON
Steel & Tube Inc., Cleveland

Part I

SPECIFYING cold-rolled strip steel is facilitated when the various tempers are understood. In the accompanying article, the first of two installments, Joseph S. Adelson, metallurgical engineer, Steel & Tubes Inc., Cleveland, describes the process of manufacturing cold strip, temper ranges and types of testing machines. The concluding installment will be presented in an early issue of STEEL.

BECAUSE of the diversified industries which use cold-rolled strip steel and because of the increasing number of applications for it, the tonnage consumed annually has increased materially in recent years. In the manufacture of cold-rolled strip steel the final rolling operation is done at room temperature with highly polished alloy steel rolls, so that the resulting product has a smooth highly polished surface. Cold rolling also makes accurate control of metal thickness possible, there being little variation either across the width of the strip or along its length.

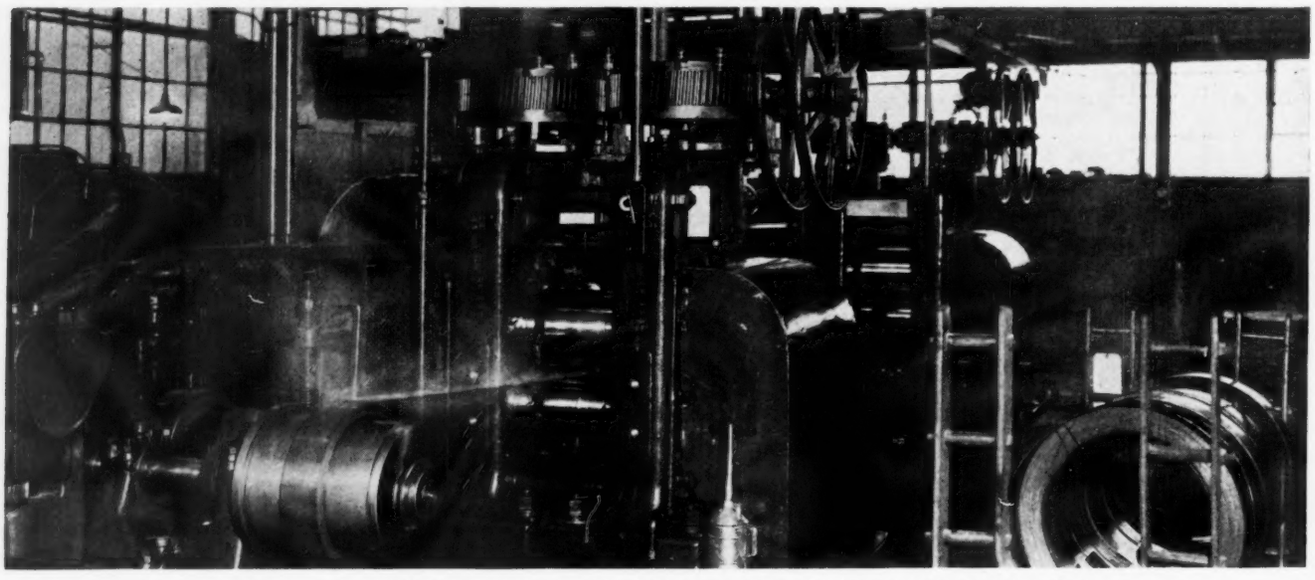
Rimmed or effervescing steel of S.A.E. 1010 analysis most generally is used in the manufacture of this product to insure maximum ductility for use in the stamping and allied industries. Both the carbon and manganese are held to the lower limits of the specification because it has been found that they tend to decrease ductility and increase hardness. Where ductility is not of paramount importance the higher carbons can be used.

The top of the ingot is discarded to insure freedom from piping and segregation and the steel then is rolled into hot strip. The finishing operation is maintained above the lower critical temperature of the steel so that no cold working takes place in the hot rolling and, consequently, an anneal is unnecessary before cold rolling. This hot strip is coiled, allowed to cool and then is pickled in a weak sulphuric acid bath to remove the scale formed in hot rolling. It may be marketed as hot strip or used as a semifinished material for cold rolled strip. In either case a pickling operation is necessary because the scale will ruin the dies if the hot strip is to be used for stampings and will mar the surface of the cold rolls and cause pits and imperfections in the fine surface of the strip.

The hot strip, which has a comparatively rough surface and is inaccurate as to gage, is now cold rolled in the same direction as all previous rolling operations. In this respect it differs from the manufacture of sheets because the sheet bar used for sheets which is the equivalent of the billet for strip, is rolled at right angles to previous conversion operations. Rolling temperatures for sheet bar are also much lower than for the billets. Cold rolling of the strip causes practically no spread so that the width of the hot strip determines the width of the finished product and all the elongation is transmitted to the length of the coil. Cold rolling is generally not completed in one pass between the rolls but is given three or four passes with the heaviest bite or reduction in thickness in the first pass, the amount of reduction decreasing in each succeeding pass as the metal hardens. Two or three mills often are arranged in tandem so that the strip moves from one stand of rolls immediately into the next.

Annealing Restores Ductility

After cold rolling, the strip is hard and brittle and must be annealed to relieve the strains and restore ductility. The reduction in thickness from hot to cold strip has been about four gages or approximately 40 per cent in order to insure sufficient cold work to prevent grain growth in annealing and to obtain a satisfactory surface. The annealing process must be so carried out that the strip retains its bright surface and does not become oxidized



Delivery side of 2-high tandem mill showing cold strip in process of reduction

or scaled. After the coils are loaded on flat bottom cars, covers are placed over them forming a box which gives rise to the term, box annealing. The joint is sand sealed and the box run into a furnace maintained at a temperature of 1450 to 1500 degrees Fahr. where it remains for about 12 hours to allow the heat to penetrate the heavy boxes. The latter then are withdrawn from the furnace and cooled to 200 degrees Fahr. before they are opened. Gas is passed into the boxes during the cooling cycle to prevent an influx of air which would produce an oxide on the surface of the strip.

The cold-rolled annealed strip is in its softest and most ductile state so that it is suitable for extra deep-drawing operations. Because of the extreme softness of the strip it has a tendency to wrinkle and kink in handling and this is avoided by giving it a slight reduction known as a skin pass, after annealing. Blanking and certain other forming operations are performed more easily on a still harder strip and these grades are produced by still further cold rolling after annealing. Of course, if the harder strip is to be furnished the gage of the material when annealed is sufficiently heavier than the finished thickness to allow for the additional reduction which has been predetermined from past experience.

Made in Five Tempers

The hardness and ductility of the cold-rolled strip can be modified over a wide range by varying the amount of rolling after annealing. The entire range generally is divided into five classes, commonly called tempers, which should not be confused with temper as applied to tool steels. Since it is obviously impossible to control the hardness to a single point on a testing machine, the strip is ordered within certain limits and the tempers serve as an indication of the grade of strip produced. The five tempers and methods of manufacture, follow:

No. 1. *Full Hard.* This temper is used for flat work and easy punching, and only where no bending is required; it may crack in bending under severe cold work. It is cold rolled direct to the finished gage from the hot strip with no intermediate anneal. A higher carbon steel (S.A.E. 1020) often is used for this temper.

No. 2. *Half Hard.* This class is suitable for easy blanking and will take a sharp right angle bend across the grain, that is, 90 degrees to the direction of rolling. The hardness in this grade is obtained by a reduction of 20 to 25 per cent in thickness after annealing.

No. 3. *Quarter Hard.* This grade will bend flat on itself across the grain and will take a sharp right angle bend along the grain. It covers a range of hardness between the blanking and deep drawing grades. The reduction after anneal will vary between 5 and 15 per cent depending upon the use of the strip.

No. 4. *Pinch Temper.* Strip of this temper will bend flat upon itself both ways of the grain and will unwind without kinking. It is satisfactory for most deep-drawing operations and is close to No. 5 temper. It is given a reduction of 0.001 or 0.002-inch after annealing.

No. 5. *Dead Soft or Deep Drawing.* This class is used for severe deep drawing and cupping operations, is soft and ductile, and is the softest grade of steel obtainable. The strip is given no rolling after annealing.

Producers of cold-rolled strip steel use several modifications of these tempers. One manufacturer designates a three quarter hard temper which would fall between Nos. 1 and 2 and is little different from No. 1, whereas another combines Nos. 4 and 5. Sometimes a No. 6 is offered which is similar to No. 5 except that the carbon content is low.

To secure definite information on physical characteristics of all tempers of cold-rolled strip steel certain data were determined including (1) hardness and ductility with definite reductions in gage both on the product rolled from hot strip and cold rolled after annealing; (2) limits of hardness and ductility for the various tempers; and (3) a comparison of physicals as determined on various makes of testing machines. It was found that existing comparison tables were not applicable to cold rolled strip steel. Various testing machines used included, Rockwell, scleroscope, brinell, Herbert pendulum, Vickers, Olsen ductility, and, Erichsen ductility.

Rockwell B hardness values were used. The test consists of measuring the depth of the impression made by a $\frac{1}{16}$-inch ball under a definite load of 100 kilograms. A minor load first is applied and then the major load; the minor load is removed and the depth of the impression read directly on the machine. The test is a good indication of surface hardness. In the scleroscope test a diamond pointed hammer is permitted to fall upon the test piece from a definite height and the height of the rebound read upon a scale. It is fairly accurate but does not have a wide range and is not entirely a determination of hardness.

The brinell testing machine presses a 10 millimeter ball into the specimen under a definite load, and the diameter across the surface of the resulting impression is measured by a microscope. The hardness figure is calculated therefrom. The standard load is 3000 kilograms but with this load the depth of the impression is such that it penetrates the entire thickness of the strip and some anvil reaction occurs. A load of 500 kilograms was used and even with this light load the impression penetrated far below the surface. The brinell hardness number is independent of the load applied.

In the Herbert pendulum test a balanced pendulum is oscillated on the test piece by balancing it on a point support and the time for ten swings determined with the aid of a stop watch. The harder the material the longer the period required per swing, and glass which consumes 100 seconds for ten swings is used as the basis for the readings. The test is too delicate for routine shop testing but has the advantage of leaving no trace.

In the Vickers machine a diamond pyramid having a square base is forced into the test piece under a definite load which can be varied to compensate for thin or soft materials. The diagonal of the impression is measured by a microscope attached to the machine and the reading converted into Vickers or brinell numbers.

Unit Values Differ

The Olsen and Erichsen ductility testers are similar in operation except that the Erichsen uses a bar having a rounded end as a die and reads in millimeters whereas the Olsen uses a ball die and reads in inches. The die is forced against the test piece forming a cup, and pressure is continued until a slight fracture is visible in the cup. The depth of the cup is determined directly upon the machine and is a good indication of the stretching qualities or ductility of the strip.

Regular cold rolling practice was followed in the preparation of the specimens. In order to secure comparable data on various gages and to check results, five different coils of hot strip were cold rolled to 14, 16, 18, 20 and 22 Birmingham wire gages at which point the product was annealed and then cold rolled further. The maximum bite possible was taken in each pass during the cold rolling of the hot strip and the total reduction made in as few passes as were necessary to reduce the thickness to the gage desired. No attempt was made to limit the reduction per pass to any definite amount or percentage. Cold rolling of the strip after annealing, on the other hand, was limited to a definite reduction per pass instead of taking the maximum. Data thus were obtained on rollings with varying percentages of reduction.

A piece about 3 feet long for testing was cut from the end of the coil after each pass. The extreme ends of the coils were discarded because they may vary too greatly from the average thickness of the balance of the coil. The gage throughout the coil varied about 0.002-inch and precautions were taken to insure accuracy in reading the thickness to determine the percentage reduction.

(To be concluded in an early issue)

ANNOUNCING . . .

GRASSELLI INHIBITOR

TWO GRADES

GRASSELLI INHIBITOR NO. 1 (NON FOAMING)
GRASSELLI INHIBITOR NO. 2 . . . (FOAMING)

THE result of five years of research development. Tested and proven throughout all of 1930 by commercial use in the Mahoning Valley.

• *Full information gladly sent on request* •

THE GRASSELLI CHEMICAL COMPANY
Incorporated
FOUNDED 1839 CLEVELAND

New York Office and Export Office: 347 Madison Ave.

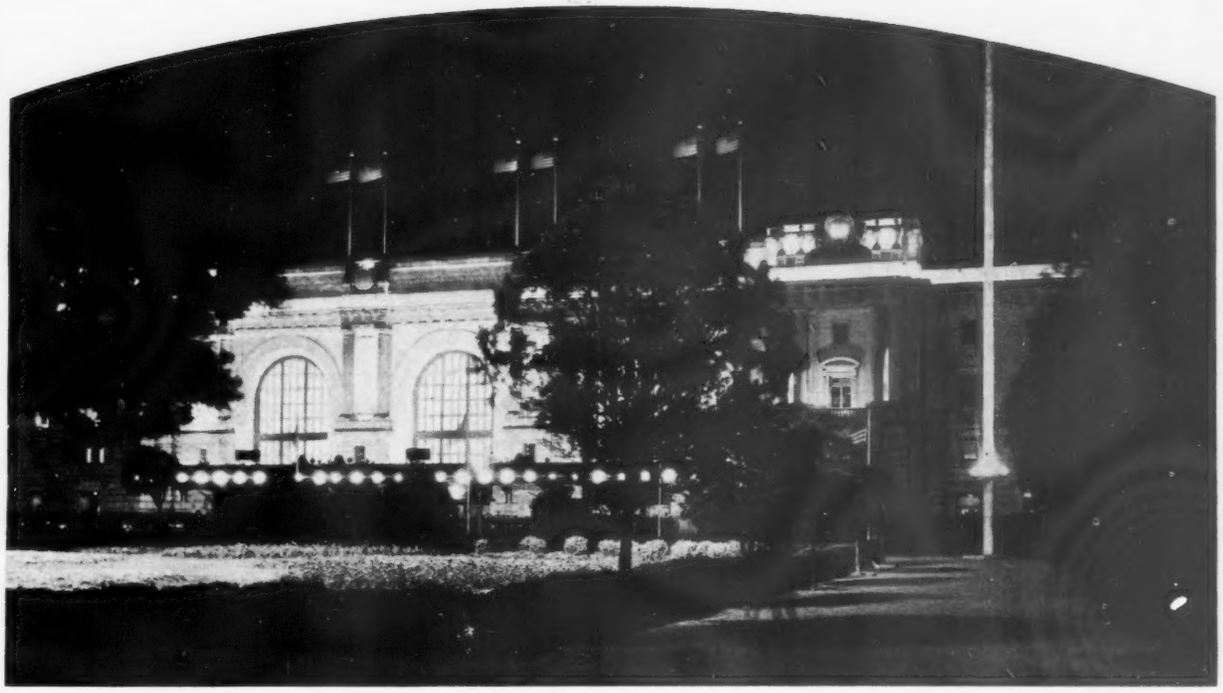
BRANCHES AND STOCK CARRYING POINTS:

Albany · Birmingham · Boston · Brooklyn · Charlotte · Chicago · Cincinnati · Detroit · Milwaukee
Newark · New Haven · New Orleans · Paterson · Philadelphia · Pittsburgh · St. Louis · St. Paul

LOS ANGELES: 363 New High Street SAN FRANCISCO: 576 Mission Street

Represented in Canada by CANADIAN INDUSTRIES, Ltd.
Heavy Chemicals Division :: Montreal and Toronto

FOUNDED 1839 GRASSELLI REG. U.S. PAT. OFF.



Civic auditorium, San Francisco, at night—scene of the second Western Metal Congress

Steelmakers Will Benefit from Open-Hearth Research

DURING the past year, the acid open-hearth steelmaking process has been undergoing searching study in Pittsburgh as a result of a co-operative agreement between the United States bureau of mines experiment station and the Heppenstall Co. Thus far, the investigation is only partially completed, but results, as revealed in a progress report presented before the Western Metal congress in San Francisco, Feb. 16-20, indicate that considerable light is to be thrown upon present knowledge of steelmaking.

The research is being conducted by C. H. Herty Jr., physical chemist, bureau of mines, and J. E. Jacobs, research metallurgist, Heppenstall Co., who collaborated jointly in preparation of the report. Two grades of alloy steel were studied, the first containing: Carbon 0.28-0.33, manganese 0.60-0.80, silicon 0.20-0.30, nickel 1.5-2.0, chromium 0.60-0.80, molybdenum 0.40-0.50, vanadium 0.15 min., phosphorus 0.040 max., and sulphur 0.040 max. per cent. The second grade contained: Carbon 0.52-0.57, manganese 0.55-0.70, silicon 0.20-0.30, nickel 1.5-2.0, chromium 0.60-0.80, molybdenum 0.20-0.25, vanadium 0.15 min., phosphorus 0.040 max., and sulphur 0.040 max. per cent.

Six factors to be studied were: 1, Elimination of nonmetallic matter originating in the charge and from the furnace lining; 2, oxidation of the metal during the working of the heat; 3, deoxidation with ferrosilicon and ferromanganese and with special manganese-silicon alloys; 4, Elimination of silicates in the ladle; 5, segregation of nonmetallic matter in the ingot; and 6, slag-metal reactions. So far, only the first four items have been studied in detail.

Spiegel Addition Helps

A summary of the work reveals that when the heat is ready to be ored it contains nonmetallic matter originating from the charge and from the oxidation of silicon. It is cleaned partly by the ore, but the addition of spiegel with the ore facilitates the removal of impurities.

Material coming from the bottom of the furnace, 20-ton oil-fired units with hearths 18 feet long and 7 feet wide and average weight of tapped metal 57,000 pounds, was picked up during the working period. High temperature will eliminate most of this by the boiling action in the furnace. Manganese-silicon alloy followed by a small manganese addition apparently eliminated any inclusions from the above source, as well as the normal products of deoxidation. Deoxidation with manganese-silicon alloy gives a much cleaner steel in the furnace than deoxidation by ferromanganese and ferrosilicon.

Iron oxide content of acid open-hearth steel increases as carbon is eliminated. Toward the end of the working period the oxide content may hold constant or decrease, even though the carbon is dropping because of changes in slag composition, viscosity and temperature. Holding the steel in the ladle as long as possible is of direct benefit in eliminating nonmetallic matter. Holding in the ladle of course has other advantages, in that it is better to pour the steel "on the cold side" rather than when the steel is exceedingly hot.

Pacific coast and adjacent territory affords a wide market for steel castings; thus the manufacture of castings is a subject of considerable interest. J. Fenstermacher, Columbia division, United States Steel Corp., San Francisco, presented a paper under the auspices of the American Institute of Mining and Metallurgical Engineers, discussing improvements in the physical properties of large carbon and alloy steel castings. The author described operations in the company's plant in Richmond and by the use of lantern slides showed some of the work turned out, including car frames, turbine wheels, dredging, equipment and housings, and crushing machinery.

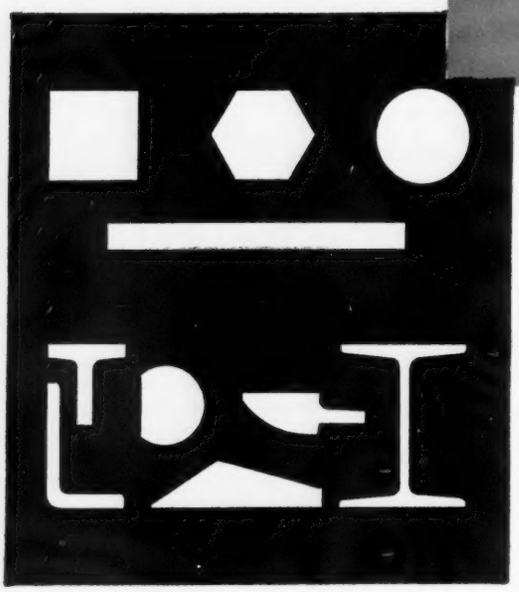
He gave consideration to chemical compositions of the basic open-hearth steels, molding and pouring practice and physical specifications. Average physical characteristics of these castings are 75,840 pounds per square inch ultimate tensile strength, 30.5 per cent elongation in 2 inches, 44,100 pounds per square inch tensile

UNIFORMITY
PRECISION
MACHINABILITY

Assured by J&L Ownership-Control over All Raw Materials and Processes of Manufacture, from Ore to Finished Product

J&L
COLD
FINISHED
STEEL BARS

ALSO
SPECIAL
SHAPES



JONES

strength and 48.5 per cent reduction of area. Many of the castings because of their extreme size and intricacy, required unusual care in their manufacture.

Manganese steel, commonly accepted as a heat treated alloy of iron containing 10-14 per cent manganese and from 0.80-1.50 per cent carbon, is widely used on the Coast, because of its great toughness and wear resistance. Mining, dredging and crushing operations call for power machinery of which many parts are manganese steel castings. These points were brought out in a paper by D. H. Young, western manager, American Manganese Steel Co., Oakland, Calif., which was published in abstract form on Page 51 of the Feb. 19 issue of STEEL.

Applications Are Numerous

Among the specific uses for manganese steel castings, particularly in the West, are mantles and jaw plates for crushing machinery, shovel teeth, dippers, ball mill liners, shells and impellers for gravel pumps, wearing parts of dredges, special trackwork, oil field sheaves for crown and traveling blocks, and many others. These castings can be heat treated to give great toughness and durability and can be welded with facility when proper procedure is employed.

High-test cast iron containing 2.70 to 3.15 per cent carbon can be produced uniformly to give 38,000 to 49,000 pounds per square inch tensile strength, 4200 to 5600 pounds transverse strength, 0.5 to 0.20-inch deflection and 200 to 240 brinell hardness. It is applicable to medium and heavy castings, particularly where the combination of strength and resistance to wear is essential. In a paper prepared by F. B. Coyle, research department, International Nickel Co., New York, cupola melting of this material was discussed in considerable detail.

Approves Coating Standard

The American tentative standard for zinc coatings on structural steel shapes, plates and bars and their products has been approved by the American Standards association. The standard was submitted for approval under the proprietary sponsorship method by the American Society for Testing Materials, as a revision of a previous standard of that organization. It includes designations of specific grades of structural steel, grades of galvanizing spelter bath, maximum amount of impurities allowed in molten zinc bath, specifications for steel embrittlement, weight of zinc coating and a test for uniformity of zinc coating. The standard departs from the previous issue in no longer designating specific grades of structural steel but permitting instead the use of steel conforming to standard specifications.

Moisture in Gas Has Effect on Carburizing Action

CARBURIZATION of steel by gas has been the subject of investigation for several years and while remarkable progress has been made, additional work is necessary before a definite procedure can be prescribed. R. G. Guthrie, chief metallurgist, Peoples Gas Light & Coke Co., Chicago, a leading authority on the process, revealed some most interesting recent developments in a paper presented before the Western Metal congress, San Francisco, Feb. 16-20.

Steel to be carburized is heated in a furnace retort into which gas is introduced and from the hydrocarbons contained in the gas the steel absorbs carbon to effect a hard case. Occasionally it is found that after long periods of successful carburization, the gas suddenly fails to produce a carbon penetration in the same steels. The solution to this baffling problem proved to be the variable moisture content of the gas; consequently it became necessary to dry all the gas by passing it through calcium chloride towers and to provide a constant moisture by dripping water into the gas. The water is dripped steadily or intermittently as required.

Best results are obtained by surging the gas into the retort in a turbulent manner for from 5 to 10 minutes after which the gas is pumped out and CO_2 gas is pumped in, allowed to remain for a brief period and then pumped out. The CO_2 gas, being an excellent decarburizer, serves the purpose of removing from the steel a dead surface film which retards the penetration of carbon. When the film has been removed, the original gas is returned to the retort and further carbon penetration is accomplished. This alternating cycle is maintained until the case of desired depth is obtained. The gas can be recirculated until all of the hydrocarbons have been exhausted.

Approximately 5 hours is sufficient to produce a good carbon penetration. Recently developed is an electrical device capable of indicating whether carbon penetration is being obtained in the steel and whether soot is being deposited in the retort. Under certain conditions, soot deposits have been unusually large, but this now can be controlled closely. It has been commonly believed that oxygen is a good decarburizer, but investigation has shown this belief to be untrue. According to Mr. Guthrie, CO_2 is the best decarburizing agent and is even more active when accompanied by a little CO.

New Interest in Gas Furnaces

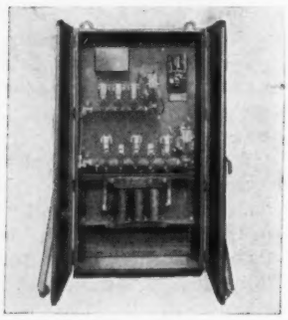
Although natural gas has been available in southern California for a considerable time, it has been distributed only recently in the northern part of the state. In the latter section fuel oil has been used generally in industrial heating operations. The present tendency is to convert these units to gas firing, a situation which has created a new interest in gas-type furnaces. For drawing operations and the recently developed nitriding process, low temperatures are used and

(Concluded on Page 63)

A section of one of the night crowds which taxed the capacity of the exhibit hall at the second Western Metal and Machinery exposition

Neglect mending 'twill soon be a small Fault, and a Great One

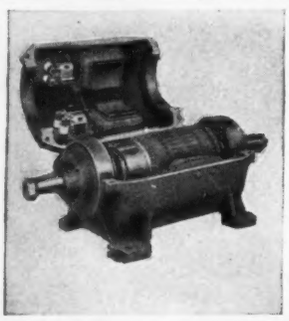
[The Sayings of Poor Richard]



A step in modernization was brought about by the frequent unexplained stopping of a large synchronous motor driving a vital unit in a plant process. Investigation revealed that the too hasty starting of a large induction motor in a remote department caused a voltage dip severe enough to throw the synchronous motor out of step. The substitution of a magnetic controller for the manual controller on the induction motor resulted in uniform starting with minimum voltage disturbance.

Trenches in the snow over buried cables in a mill yard revealed overheating of the distribution system because of low power-factor. The mill power-factor was unity by virtue of a battery of synchronous motors near the substation. Inside circuits with lagging power-factor of 0.72 were improved by substituting, at strategic points, 0.8 leading-power-factor synchronous motors for induction motors. The superseded induction motors were later used, fully loaded and in conjunction with synchronous motors, in an addition to the mill.

Did you know that a photoelectric tube could be made to do the work of a stop, dog, latch, or cam? Here's an example: A length of pipe is chucked near the middle, no care being taken to locate it. Two motor-driven tool carriages rush in towards the ends and, when one-eighth inch from contact, they slow down to feeding speed. The tools then face and bevel the pipe ends for field welding. The tool carriages act as they do because the pipe intercepts beams of light carried by the carriages. This modern type of cam, dog, etc., involves no maintenance, for a beam of light has no wearing parts.

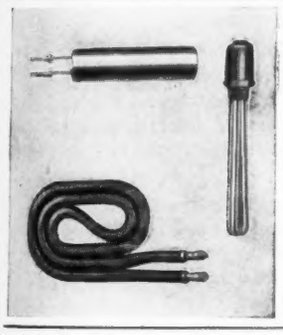


Modern motors designed for quick starts, stops, and reversals, absorb only a small amount of power for their own acceleration, hence leave more for effective work. They are just coming into use for shears, whereon they start, accelerate, execute the work, and stop for each operation. This does away with flywheel and jaw clutch, simplifies the machines, and reduces maintenance. One such machine cuts three 8-in. by 8-in. blooms at a time—fourteen complete cycles per minute. A shear cutting 40-inch-wide material goes through the complete cycle in less than one second. The trend is to let the motor do it.

Any manufacturer who still feels that metallic arc welding might not be dependable should take note of the fact that big gun-mounts are being thus fabricated at the Watertown arsenal by the U. S. Government. Modern materials, equipment, and technique have made the arc-welded joint capable of standing any amount of shock duty that the parent metal will stand. Small wonder that manufacturers of machine tools and plant equipment are rapidly changing over their products to arc-welded steel construction and are obtaining a simpler, stronger, lighter, more rigid product with an enhanced appearance that stimulates sales.

The old "layshaft" and other rigid mechanical means for holding related equipment in synchronism while working on a common product are giving away to electric synchronization. Feeders are synchronized with the machines they feed, by Selsyn control, and the units may be any distance apart. To synchronize devices at full speed has never been difficult, but now it is possible to hold many units in absolute synchronism all the way down to dead stop and up again to full speed. This is done on a multiple-unit printing press and so accurately that, if desired, an "i" printed on one unit might be dotted on the next.

Speaking of modernization, have you studied all the possible applications to your equipment of the new G-E thrustor? This electric device exerts a smooth, powerful, constant-pressure thrust with cushioned return. On the up stroke, oil is pumped through a piston by a motor-driven impeller. On the down stroke, the piston sinks through a cushion of oil. Some suggested applications are: (1) the smooth, certain application of brakes to hoists. (2) The engaging of clutches on punch presses or shears. (3) The replacement of muscular effort on foot- and hand-operated machines, thus making the machines "all-electric."



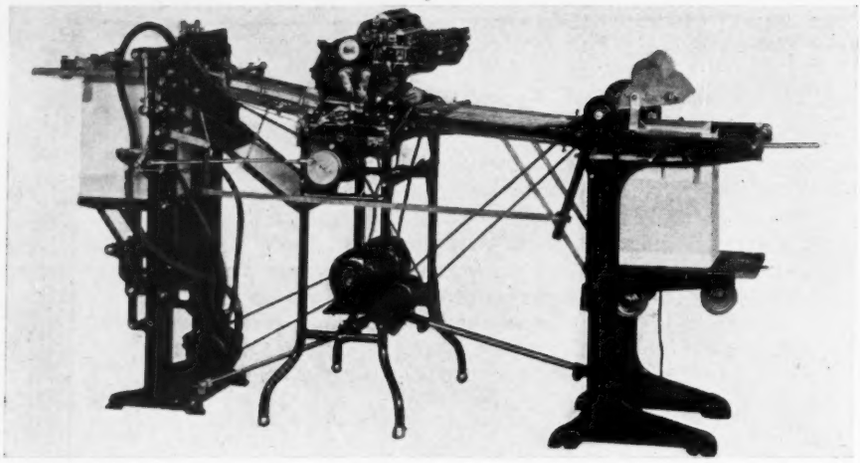
In the past, when a machinery builder wished to build heat into his machines, or a plant engineer wished to apply a limited amount of heat to a process, it was necessary to install a steam boiler, or to run complicated fuel pipe lines to the zones to be heated. To-day, a G-E heating specialist is called in and, after studying the requirements, recommends G-E "Spots of Heat"—handy, self-contained, electric heating units which can be immersed, screwed in, built in, or simply attached to the machinery or equipment to provide clean, safe, odorless, precisely controlled electric heat.

Modernization Reduces Costs—Increases Profit

There are any number of ways in which the G-E sales engineer can help you to modernize. Ask him about them when he calls; or write the nearest G-E office.

200-463

GENERAL ELECTRIC



A miniature self-operating printing press, made possible by the use of steel

Large Uses of Steel in Small Ways

186th Article ◆ ◆ Multigraphs

TO THE average individual the multigraph is the same, simple little apparatus for assembling type in slots on a cylinder and printing letters that it was about a quarter of a century ago. To the initiated it is a highly developed machine—a miniature, self-operating printing press—for the production of a wide variety of printed matter and for addressing envelopes. Steel has played an important part in its development.

Approximately 187 tons of steel is consumed annually in the manufacture of multigraphs, including feeding and receiving devices, as well as the printing unit itself. This amount of steel is composed of 25 tons of strip, 150 tons of screw stock, 10 tons of machine steel and 2 tons of tool steel.

Castings Are Employed

Iron in the form of castings is used to some extent, while an aluminum alloy is used for the semicircular drum on which is mounted the type, and when illustrated matter is printed, the engraving. Bronze bearings are used in the lighter models, while the heavier models are equipped with ball bearings.

T-shaped strips of steel are imbedded on the periphery of the drum, a series of these forming the slots in which the type is held in place. The space between these slots corresponds to a single space on a typewriter, so that type can be assembled single space, double space, or any multiple thereof. The lines of type can be of any length desired, and they are held securely in place by flexible steel clips and bands. This was the original idea of the multigraph, for the production of a large number of form-letters, and it still is the principle of the modern machines.

The bases and sideframes of the machines are cast iron, while nearly all the moving parts, and those taking the strain, are steel. The amount of steel consumed is not so large as might be supposed, as sufficient strength is obtained by light-weight parts. Multigraph machines are made in many sizes and models, weighing from 75 pounds for the simple hand-operated printing unit to 300 pounds for motor-driven machines with feeding and receiving attachments. The original multigraph was operated by turning a crank—just as the original phonograph was operated, and it proved to be an economical, time and labor-saving device; but by far the largest demand now is for those which are driven by electric motors and entirely automatic in operation, illustrating the constant urge for labor-saving equipment in business offices.

Feeder Is Ingenious

The feeding mechanism is almost as ingenious as the printing unit itself, which was an important invention. An automatic suction device lifts each sheet of paper, and if by any chance two sheets should be lifted another automatic mechanism draws the pair of them out of the machine, and the feeder feeds the paper into the printing unit faster and more evenly than could be done by an experienced press feeder. Up to 5000 sheets can be printed in an hour. The technical term for the receiving unit is a thermo jogger, and its function is to impart enough heat to the ink as the sheet passes under it to dry it, thus preventing the ink from one sheet smudging the next sheet, and to stack the sheets in an even pile.

In the latest models envelopes and business letterheads are fed into the machine at the same time, the envelopes are addressed and the letters printed, properly addressed at the same time. The letterhead is expelled from the machine, and the envelope is automatically dropped on top of it—all in order, so that a girl needs only to insert the letters in the envelopes in rotation.

Each address on a mailing list is embossed on a small metal sheet, and this sheet is quickly slipped into position on the drum, and after an envelope and letter have been addressed it is removed and another inserted.

Standard Steel Price Extras in Handy Volume

Daily Metal Trade Standard Steel Price Extras, by Walter S. Doxsey, editor *Daily Metal Trade;* second edition; paper 96 pages, 5 x 7½ inches; published by Penton Publishing Co., and supplied by STEEL, Cleveland, for $1, postpaid; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 5s post paid.

In this compact book of 96 pages have been gathered data usually available only in a file of various-size cards, booklets, and other forms difficult to catalog and to handle. The convenience of assembled information, well indexed and ready for instant reference is appreciated by those having occasion to use the tables of extras on any form of steel material.

The volume includes every commonly-used table of steel price extras, structural steel, plates, bars, sheets, strip, pipe, nails, wire, tubing, rivets, nuts, bolts, floor plates, alloys and many others.

The arrangement has been made as convenient as possible and a complete index gives straight-line guidance to any table desired.

In addition to extras the book contains tables of tolerances and various specifications frequently brought into question, and a table of physical properties of seamless mechanical tubing.

To Exhibit Special Alloys

Exhibits portraying the commercialization and use of highly specialized alloys will form one of the principal focal points of the Exposition of Chemical Industries to be held at Grand Central Palace, New York, May 4-9. The growth of this field and its expansion into nearly every industry since the last show, two years ago, has been one of the most remarkable phenomena of modern research.

Moisture in Gas Has Effect on Carburizing Action

(*Concluded from Page* 59)

difficulty has been experienced in keeping gas furnace temperatures low enough.

For this reason a new nitriding furnace, described by James H. Knapp, president, James H. Knapp Co., Los Angeles, attracted considerable attention. Semimuffle furnaces are suitable for operating at 1200 degrees Fahr. and up, but nitriding requires a long heat at uniform temperatures in the neighborhood of 960 degrees Fahr. A satisfactory furnace for the latter duty must introduce two new features: 1, Some method of reducing the high spread between flame temperature and temperature of work; and 2, some method for uniform and rapid circulation of gases.

Several furnaces in which these problems have been solved have been in continuous operation for six months. Sketches and illustrations of one of these furnaces together with an abstract of Mr. Knapp's discussion appeared on Page 38 of the Feb. 19 issue of STEEL.

Special Burner Design

A mixture of gas and air properly proportioned for perfect combustion is discharged through an inner pipe and burns in a cone off the end of a second pipe prolong. A focus of high temperature is overcome by blowing cold air through a larger surrounding pipe, in an annular sheath surrounding the flame. The burning gases mix with the cold air in this sheath, diluting them and reducing the intensity of heat.

A motor-driven blower is mounted on top of the furnace casing and furnishes air for the operation of the unit. The blast is divided by a Y connection near the blower, one portion going to the gas and air mixer, the remainder to the air cooling or diluting system. Gas and air are apportioned automatically in a mixer complete with a regulator which reduces the gas line pressure to atmosphere.

Progress and development of gas-fired furnaces was discussed in a paper by E. G. de Coriolis, research engineer, Surface Combustion Co., Toledo, O. The speaker first reviewed methods of firing and combustion and then described major types of furnaces utilizing gas fuel. A number of lantern slides showed numerous typical installations.

A research which had for its purpose the correlation of crystal structures and hardness of nitrided cases was reported by Oscar E. Harder, assistant director, Battelle Memorial institute, Columbus, O., the research having been pursued jointly by Dr. Harder and George B. Todd, Aluminum Research Laboratories, metallurgical division, New Kensington, Pa. Several steels were studied in the investigation with the X-ray diffraction method used to study crystal pattern. The technique worked out for the examination of nitrided cases seemed to present a more direct and satisfactory method of study than has previously been reported.

Various Factors Affect Growth of Gray Cast Iron

THAT gray iron increases in volume, cracks and distorts upon repeated heating and cooling is rather common knowledge, according to Walter E. Remmers, metallurgical engineer, Western Electric Co., Chicago, who presented a paper on the permanent growth of gray cast iron before the iron and steel division of the American Institute of Mining and Metallurgical Engineers, at the annual meeting of the institute in New York, Feb. 16-19.

In his study Mr. Remmers was able to increase the length of a 6-inch bar by about ¾-inch by repeated heating and cooling. He attributed this phenomenon to precipitation, solution and reprecipitation of graphite in the solid matrix material. Ordinarily this effect is predominant in the growth obtained on the first heating after casting. Another cause for growth, Mr. Remmers stated, is mechanical swelling created by finely fracturing the slightly ductile structure of gray cast iron.

Alloying elements such as silicon, aluminum, and under certain conditions titanium and nickel, which favor the precipitation of carbon, tend to increase growth while other elements such as chromium and manganese, which exert a stabilizing effect on the carbon, tend to decrease growth.

James T. McKenzie, metallurgist and chief chemist, American Cast Iron Pipe Co.. Birmingham, Ala., questioned Mr. Remmers on the effect of chromium. He said his experience showed that chromium made the metal brittle. Mr. Remmers said that was the case with larger additions of chromium but that with small amounts of chromium the opposite effect was noticeable.

Floyd C. Kelley, metallurgist, research laboratory, General Electric Co., Schenectady, N. Y., described the bright annealing of steels in a special furnace with hydrogen atmosphere. In his experimental work he found difficulty in eliminating oxygen as steel to be annealed was found to contain absorbed oxygen at the time it was placed in the furnace.

Mr. Kelley described the continuous annealing of metal strips through a hydrogen-atmosphere furnace and also the continuous annealing of corrosion-resisting steel. In the latter case two furnaces are used. Purified hydrogen is passed through the tube of the first furnace, the tube being filled with powdered alumina plus ferrosilicon heated to 900 degrees Cent. It then passes into the annealing tube in the second furnace which is heated to 1100 degrees Cent. The rate of flow of the hydrogen is maintained at from 2½ to 5 liters per hour. Chrome-nickel steel ribbon enters the furnace through a graphite stopper and passes through a slot in the cold end of the annealing tube before it becomes heated. The ribbon is drawn through at the rate of 2 feet per minute and emerges with a perfectly bright silvery luster. Its hardness drops from 110 Rockwell B to 71 Rockwell B.

Use of Electroline Debated

In the discussion following Mr. Kelley's paper George B. Waterhouse, consulting metallurgist and professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass., inquired about the use of electroline. Mr. Kelley said he would not expect to be able to use it on annealing 18 and 8 chrome-nickel alloys and have them come out bright. J. B. Austin, United States Steel Corp., New York, asked for further information about electroline and it was brought out that this product is obtained from cracking city gas by blowing steam into it at high temperatures. It contains 75 per cent hydrogen, 18 per cent carbon monoxide and smaller amounts of carbon dioxide. G. D. Boyd, general superintendent, Wallingford Steel Co. Inc., Wallingford, Conn., described the operation of a large furnace built to anneal continuously 18 and 8 chrome-nickel alloy strip. He said this furnace has been in operation on a production basis for about six months and is proving highly successful.

Other papers at this session included comment on blue brittleness by Leland Russell van Wert, assistant professor of metallurgy, Carnegie Institute of Technology, and lecturer in metallurgy, Harvard University, Cambridge, Mass.; and a paper by Albert Sauveur, professor of metallurgy, Harvard university, on "The Austenite-Pearlite Transformation and the Transition Constituents."

Beardsley & Piper Uses James Speed Reducers!

It is a compliment to James Design and Engineering that each year finds more leaders among specialized equipment manufacturers standardizing on James Speed Reducers.

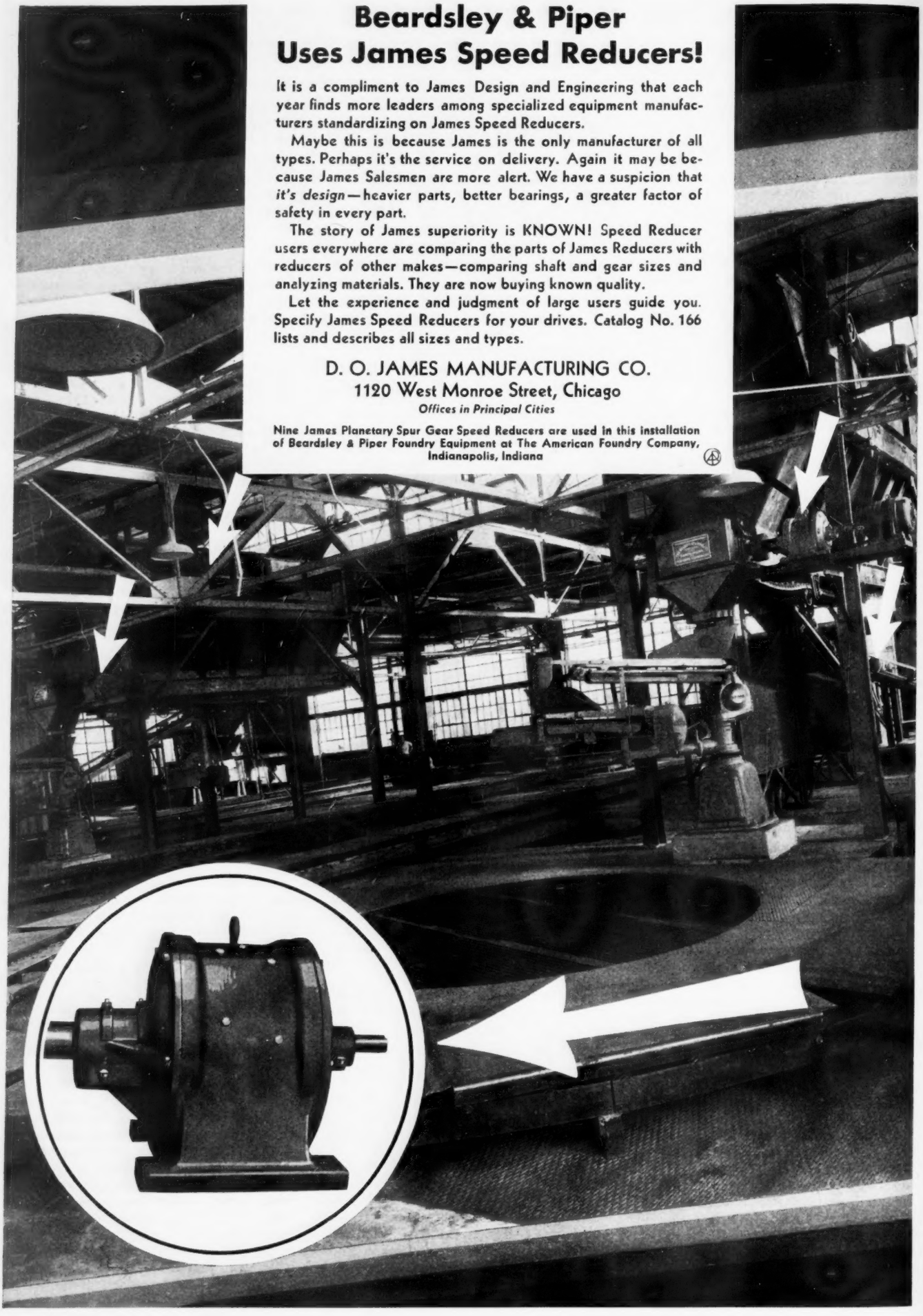
Maybe this is because James is the only manufacturer of all types. Perhaps it's the service on delivery. Again it may be because James Salesmen are more alert. We have a suspicion that *it's design*—heavier parts, better bearings, a greater factor of safety in every part.

The story of James superiority is KNOWN! Speed Reducer users everywhere are comparing the parts of James Reducers with reducers of other makes—comparing shaft and gear sizes and analyzing materials. They are now buying known quality.

Let the experience and judgment of large users guide you. Specify James Speed Reducers for your drives. Catalog No. 166 lists and describes all sizes and types.

D. O. JAMES MANUFACTURING CO.
1120 West Monroe Street, Chicago
Offices in Principal Cities

Nine James Planetary Spur Gear Speed Reducers are used in this installation of Beardsley & Piper Foundry Equipment at The American Foundry Company, Indianapolis, Indiana



Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Elastic Analysis

Theorems dealing with the elastic analysis of continuous frames, presented in bulletin No. 215, *Engineering Experiment Station, University of Illinois, Urbana, Ill.,*

In this bulletin is shown that bending moments in arches, haunched beams, and framed bents may be computed by a procedure analogous to the computation of fiber stresses in short columns subject to bending, and that slopes and deflections in these structures may be computed as shear and bending moments, respectively, on longitudinal sections through such columns.

The theorems make available for the analysis of plane elastic structures the literature of beam analysis, dealing with the kern, the circle of inertia, the ellipse of inertia, graphical computations of moments and products of inertia, and conjugate axes of inertia.

Certain terms are defined in such a way that the method is extended to include the effect of deformations due to longitudinal stress and to shear in ribbed members, and to include trussed members.

The conceptions used in arch analysis by these methods make possible a general statement of the relations of joint displacements to joint forces, of which the equation of slope-deflection is a special case, and hence make possible the convenient extension of the method of slope-deflection, or of the theorem of three moments, to include curved members and members of varying amounts of inertia.

STEEL 3-5-31

FABRICATION:

Heating for Forging

Fundamental principles for heating blanks for forging, discussed by R. M. Keeney, in Metals & Alloys, January 1931, *p.* 3, 5 *pp.*, 4 *tables*, 7 *illusts.*

Overheating, driving at too fast a rate and nonuniformity of heat application result in a hot surface, but a cold interior. To obtain the proper grain size in the finished forging, there must be co-ordination of the initial heating temperature, the rate of working and the finishing temperature, so that work is completed close to the critical range of the steel being processed. If the initial heating temperature is too low, the piece may not be shaped completely by the time it has cooled to the critical range, and if working continues, distortion results. If the heating temperature is too high working may have been completed so far above the critical range that a coarse structure develops, and the steel may have been burned. Production of satisfactory forgings from the correct steel under skilled metallurgical supervision requires: 1. A uniformly heated furnace chamber, designed so as to result in uniform application of heat to the stock; 2. Temperature control equipment of such a nature as to prevent heating the stock above the desired temperature; and 3. Atmospheric control.

STEEL 3-5-31

PRODUCTION:

Bright Annealing

Discussion of fundamental principles and a laboratory furnace for bright annealing, a paper by Floyd C. Kelley presented before the iron and steel division at the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York, February 16-20. 8½ *pp.* 3 *illusts.*

An ever increasing demand for furnaces with controlled atmospheres for annealing special types of corrosion-resisting steel and iron and low-carbon steel sheets, is a present day trend. Difficulties involved in the so-called bright annealing of such materials are many. Small laboratory hydrogen furnaces have been operated successfully but careful attention must be given to installation, hydrogen pressure, etc.

A laboratory furnace for the continuous annealing of corrosion-resisting iron is described. The author states that construction of larger furnaces presents unusual problems due to the necessary high temperatures involved in the annealing of this material.

STEEL 3-5-31

Blue Brittleness

Some notes on blue brittleness, a paper presented before the iron and steel division at the annual meeting of the American Institute of Mining and Metallurgical Engineers, New York, February 16-20, *by Russell Leland VanWert,* 8½ *pp.*, 4 *illusts,* 1 *table.*

Stress-strain diagrams of low-carbon steels tested within the temperature range of 200 to 350 degrees Cent have been found to depart more or less from the normal regularity of such diagrams as obtained by testing at either above or below these temperatures. These irregularities are brought out more clearly in torsion tests and are associated with the "blue heat" phenomen of steel. The author suggests as the possible cause of these "steps" in the stress-strain diagram the elastic recovery of the metal. Diagram and data are presented supporting the author's contentions.

STEEL 3-5-31

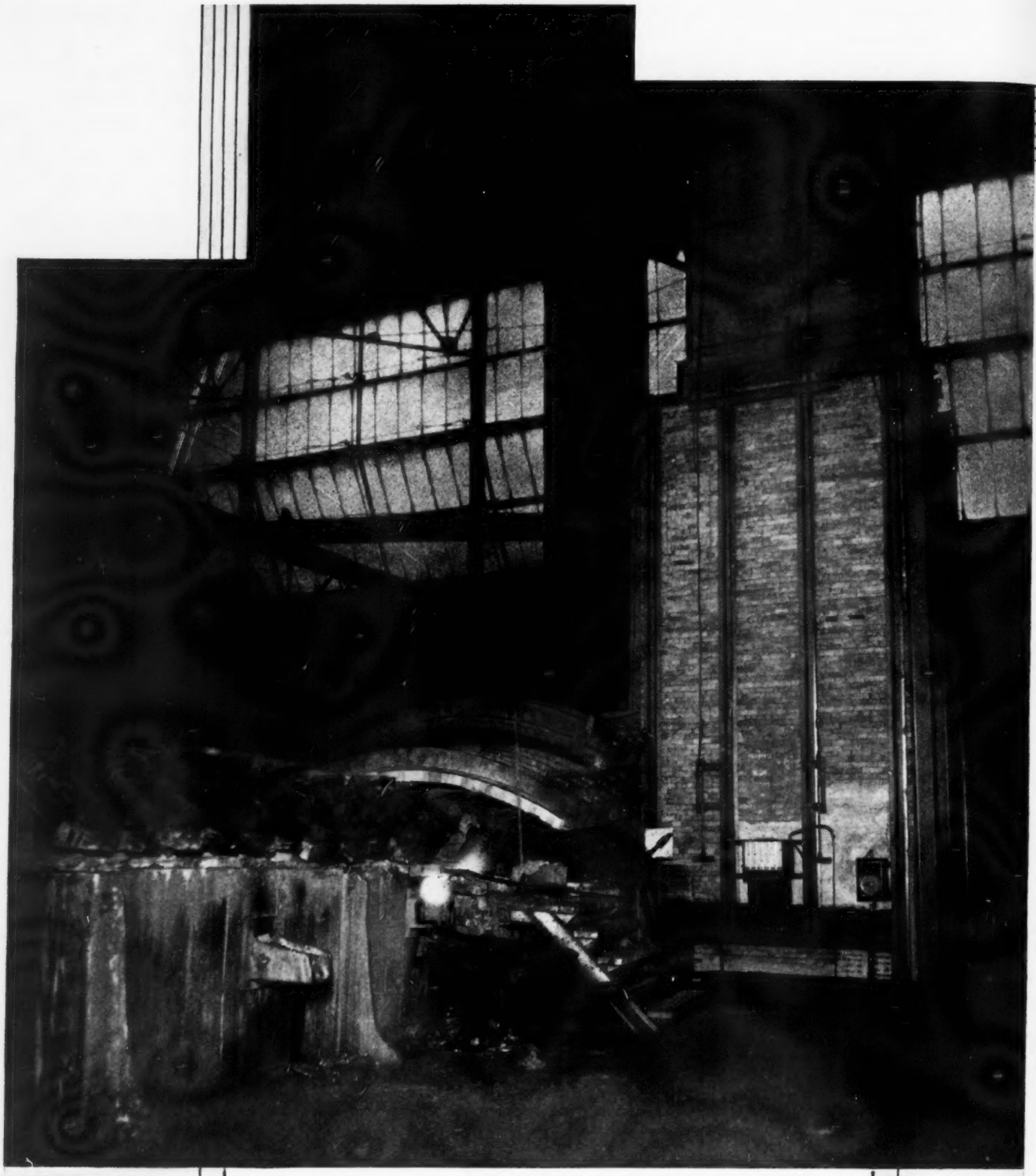
MISCELLANEOUS:

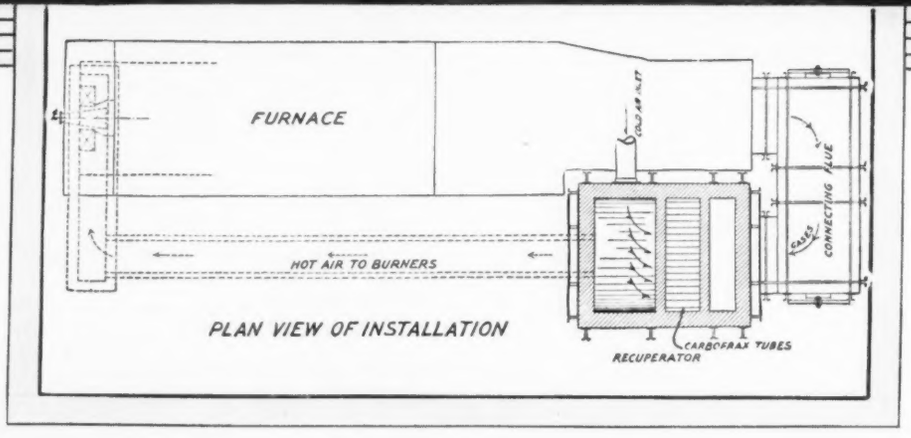
Reclamation of Metals

Origin, History and development of secondary metals traced by G. H. Clamer, in the Metal Industry, February 1931, *p.* 75, 2 *pp.*

Sources of scrap metals including those resulting from fabrication and those resulting from discarded useful or ornamental structures, the innumerable channels through which scrap metals are collected and how such material is converted into useful form are discussed by the author. Color is the main guide in sorting. The largest consumption of copper is for wire for electrical use, its average life being about 20 years. Approximately 170,000 tons of nonferrous scrap is derived annually from scrapped automobiles.

STEEL 3-5-31




FURNACE
COLD AIR INLET
GASES
CONNECTING FLUE
HOT AIR TO BURNERS
PLAN VIEW OF INSTALLATION
CARBOFRAX TUBES
RECUPERATOR

and now-

A Recuperative AIR FURNACE- made possible by THE CARBORUNDUM COMPANY

REG. U.S. PAT. OFF.

RECUPERATOR

OVER a year ago a Carborundum Company Recuperator was installed at the Cadillac Malleable Iron Company, Cadillac, Michigan.

□ This installation is unique and unusual in that the recuperator is successfully operated with a malleable iron air furnace.

□ The furnace is powdered-coal fired and is normally operated to produce two 22-ton heats per day.

□ The recuperator was connected without interrupting operations and for over a year it has been operated without the loss of a single heat.

The Results

□ The user reports that fuel consumption has been reduced 40% over previous practice of operating with atmospheric air for combustion and

—there is a saving of one hour per heat.

—a decided improvement in metal characteristics has been noted.

—the reduction in fuel consumption eliminated the necessity for additional pulverizing equipment.

—a distinct reduction in metal losses due to oxidization has been observed resulting in lower cost of raw material per ton of good castings.

—and they can control pouring temperatures much more accurately than they could with atmospheric air.

□ The outstanding feature of The Carborundum Company Recuperator lies in the fact that it employs banks of tubes made of "Carbofrax"—the Carborundum Brand Silicon Carbide Refractory.

□ These tubes have a high heat transfer—eight to ten times that of fire clay refractories.

□ Core busters in the tubes greatly facilitate the transfer of heat from waste gas to air.

□ The "Carbofrax" tube maintains its refractoriness and physical strength even at the highest temperature encountered in commercial furnaces.

□ Long life of the tubes—their resistance to corrosive action—the absence of moving parts—the design of the recuperator—its low maintenance cost—its adaptability to practically all types of industrial furnaces—particularly those requiring high flame temperature—these are some of its decided advantages.

Bulletins, Data Engineering Service Upon Request

▽

CARBORUNDUM AND CARBOFRAX ARE REGISTERED TRADE MARKS OF THE CARBORUNDUM COMPANY

THE CARBORUNDUM COMPANY, Perth Amboy, N. J.

Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

Versatility Grows in Importance as a Trend in Machine Tool Design

WITH sweeping design changes occuring with increasing frequency in metal products manufactured under large-scale production conditions, and with complete shifts from one product to another a common occurrence under present conditions, highly specialized machines designed to perform limited operations on some one piece have become more hazardous investments than formerly was the case. This condition is reflected in the rising importance of a factor in the newer standard production machine tools, which factor can best be characterized as "versatility." This characteristic is plainly evident in numerous improved production machines announced in the last six months.

What Versatility Means

The modern significance of versatility in no way should be confused with the uneconomic all-around ability of certain equipment of the old days when the variety of machine tools was limited and when milling, grinding and heavy boring in lathes, and surfacing of small parts in large, unwieldy planers was common practice. Versatility today means the possible efficient application of a standard production tool to a wide range of sizes and shapes of the particular kind of work for which it is designed.

To attain such versatility, a marked tendency exists to allow more room for tools and attachments, to provide more tooling stations—some of which can be skipped in the operating cycle in case they are not required, to provide greater range of speeds and feeds so that maximum efficiency will be possible over a wide range of work, and to make provision for the ready application of various auxiliary attachments to broaden the scope of the machine to meet special requirments.

A machine tool of this kind can be built at minimum cost because it lends itself to quantity production, and at the same time it is in line with the modern trend toward the elimination of unnecessary sizes and models. It opens up new possibilities to the tool designer by giving him increased range for the development of his ideas. It is an incentive to the user to reequip, because it insures him against sudden wiping out of the value of the machine through sweeping changes in product during its useful life. In such an event he only will need to retool it at comparatively small cost to make it entirely effective on work of different size and shape from that for which it may have been installed originally.

This matter of versatility is one which is occupying the minds of leading machine tool builders today, being unquestionably a design trend of major importance.

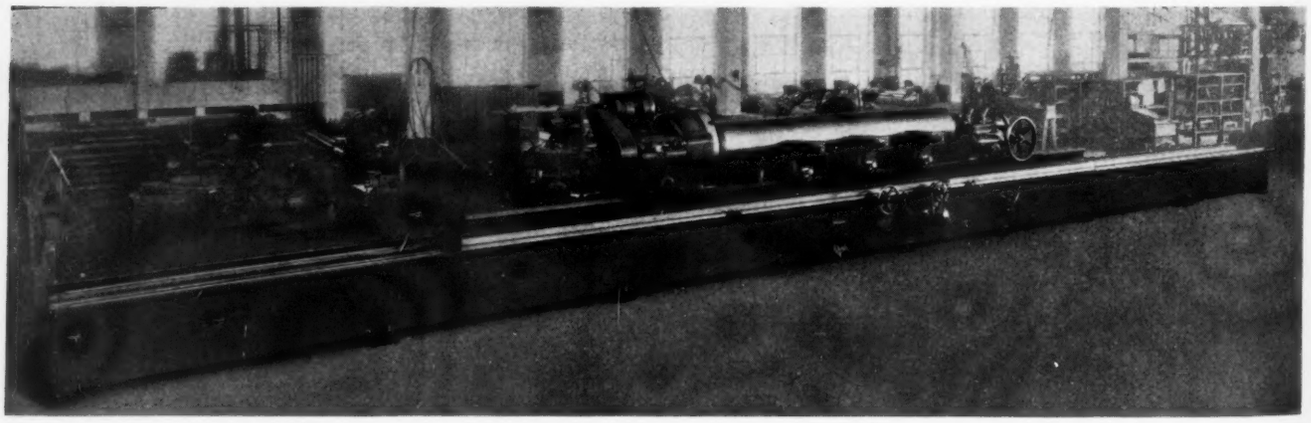
◆

Cylindrical Grinder Is of Record Breaking Size

Norton Co., Worcester, Mass., lately has completed what is believed to be the largest traversing table grinding machine in the world. This machine, which is shown in the accompanying illustration, will handle work up to 36 inches in diameter and 24 feet in length, and up to 20 tons in weight.

The machine will grind to a mirror finish and within extremely close limits of accuracy; easily within 0.0005-inch for concentricity and straightness. It has a production rate of several times that of the average cylindrical grinding machine of medium size. Under test it removed 6 cubic inches of cast iron per minute.

The machine was built for the Southwark Foundry & Machine Co. of Philadelphia. It will be used principally for grinding rams and columns for mammoth hydraulic presses at the Eddystone plant of this company. It will permit finish grinding direct from rough turning, effecting a considerable saving over the former method of finish turning and polishing with the



This massive cylindrical grinding machine, which accommodates work 36 inches in diameter, 24 feet long and up to 20 tons in weight, is said to be the largest tool of its kind ever built

obvious higher degree of accuracy and better quality of finish. The machine is built on the same fundamental principles of design as all Norton cylindrical grinding machines. It is rigidly constructed so that, despite the tremendous weight of the work being ground and the unusual length of the machine, no vibration is caused in operation.

The work is driven by a headstock, which in this case has a live spindle 10 inches in diameter, its ball bearing assembly being 16⅛ inches in diameter. The headstock is equipped with a chuck and at the other end the work is supported by a footstock provided with a regular center. These centers are 4½ inches in diameter and 24 inches long. They are made of special alloy steel. The headstock and footstock are adjustable along a massive work table, which weighed when finished 16,448 pounds. This table was cast in a single piece to insure rigidity.

Unique Wheel Slide Design

The wheel slide is massive, supported by large ways, one flat and one V-shape, which are provided with forced feed lubrication. The movement of the slide is by means of a large feed screw and half nut which have been lapped together and act as an immense micrometer. In spite of the tremendous weight of the slide, this mechanism can be adjusted in position within 0.000125-inch. There is also provision for moving the wheel slide in and out rapidly by power.

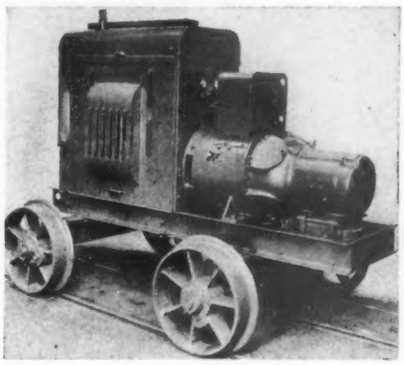
The base is 57 feet long and made in three sections, weighing 36,755 pounds. It is interesting to note that when the center and largest portion of the base, 25 feet long, was cast the rough casting was less than 3/16-inch out at its greatest divergence from a straight line. More than a ton of metal was removed, however, from the three sections of the base during the planing operations.

Unusually large journal rests are provided for the machine, having a capacity of 30 inches diameter. The machine has a patented interlocking device on the table drive mechanism. Twelve speeds are provided for the work table. The motors required are 30 horsepower for the wheel and table traverse and 20 horsepower for the headstock.

◆

Arc Welder Is Mounted on Small Railway Truck

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., announces a new unit in their line of portable welding outfits. This unit, shown in the accompanying illustration, is mounted on a truck with flanged wheels for service on railroads, in mines, etc.



Railway and mine conditions are met by this portable electric welder

The welding machine itself is one of the 2000-ampere flexible arc models. It is a self-contained unit, designed to be controlled easily by a single operator, and is particularly suited to construction work carried on beyond the reach of power lines.

◆

Swaging Machine Connects Terminals to Cables

Langelier Mfg. Co., Providence, R. I., has designed a special swaging machine which compresses pocket ends of copper terminals upon flexible insulated cables so that cable end and terminal form an exceedingly strong connection. The accompanying illustration gives a clear idea of this machine.

There is a transverse slot across the enlarged end of the main spindle, in which dies and hammerblocks are free to slide. As the spindle revolves, dies and hammer blocks are thrown outward by centrifugal force and again inward by contact with 12 equally spaced rolls in a ring in the machine head. This causes rapid opening and closing. The spindle is carried in bronze bearings of generous size, between which is the heavy flywheel grooved for eight V-belts. Power is furnished by a 15 horsepower motor running at 1200 revolutions per minute, flywheel, belts and motor pulley being covered by a guard when the machine is in operation.

The operator slips the pocket end of a terminal over the bared wires at the end of a cable and places it between the open dies with its blade ends in a slotted mandrel behind the dies. The swaging cycle is started by pressure on a foot pedal and upon its completion the terminal is withdrawn, firmly swaged to the wires of the cable. The same procedure is followed with the other end. The machine can be set to stop at the end of each cycle or it can be set to run continuously. The work is gripped by air operated collets during swaging.

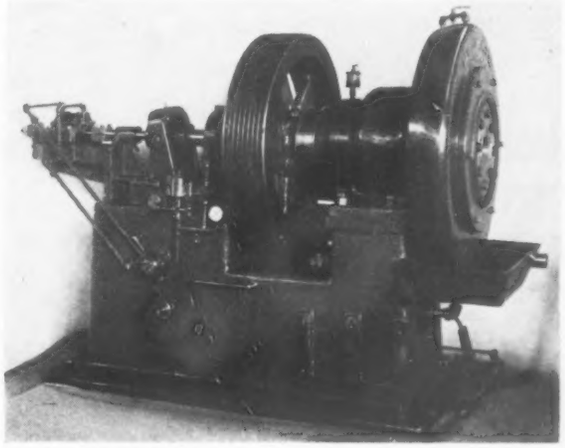
The machine has an output of nine small terminals, or six large terminals per minute. It occupies 5 x 8 feet of floor space, stands 5-feet high overall and weighs approximately 8000 pounds.

◆

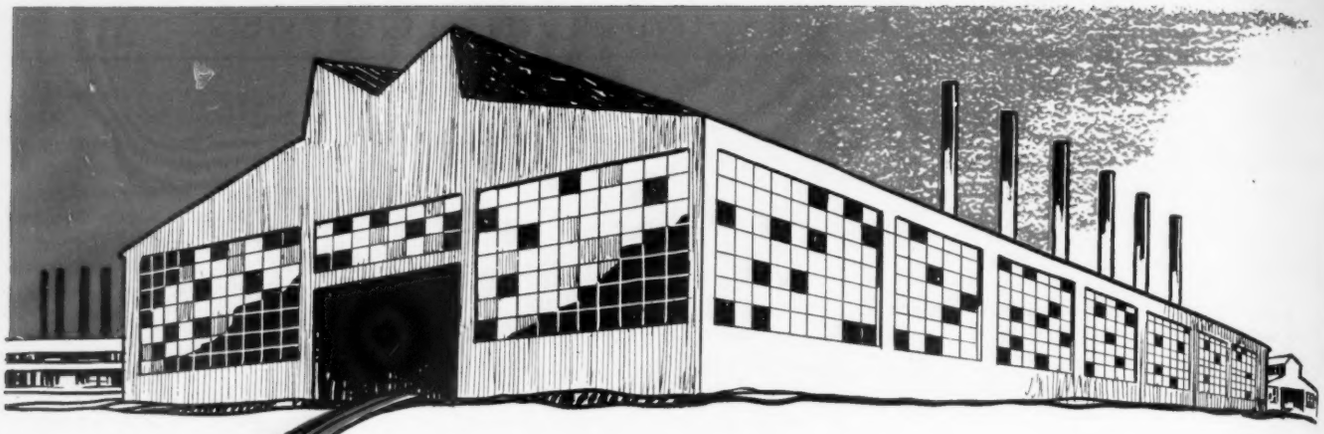
Unique Drive Incorporated Into "Mule Haulage"

Wellman Engineering Co., Cleveland, has made a unique application of alternating-current motor equipment in connection with one of its mule haulage units for placing railroad cars on the cradle of a revolving car dumper. The driving and winding units of this device, which was built for the Koppers Construction Co., is shown in the illustration which appears on Page 74.

The electrical equipment is unique in that it consists of a 500-horsepower

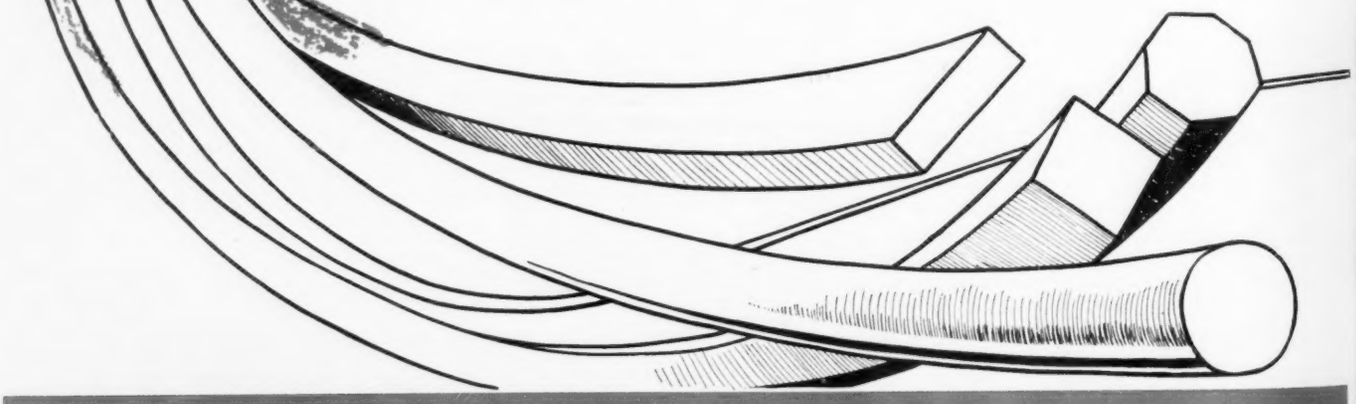


Swaging of copper terminals to cable ends is accomplished by this machine at high speed, cable wires and terminal pocket ends being compacted together like solid metal



INGOTS
BILLETS
RODS

Our many years of specialization in rolling Round, Square, Keystone, Rectangular and Flat Rods from the highest quality Carbon and Alloy Steels, assure you a constant source of supply for dependable material.



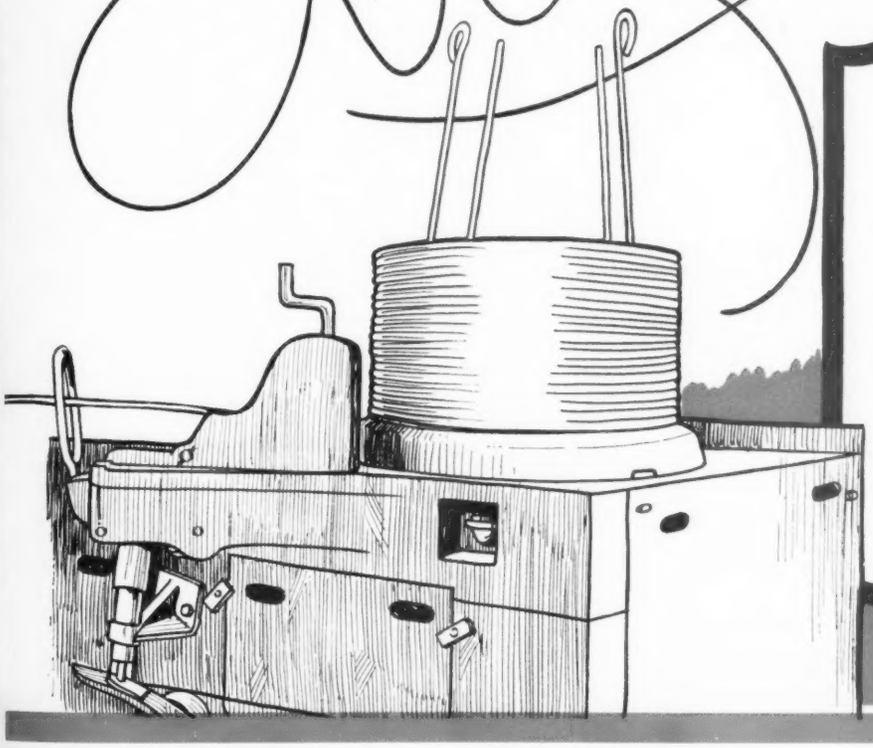
Washburn Wire Co.

Phillipsdale, R. I.

FLAT and ROUND HIGH CARBON

Wires

Dependable Quality for Distinctive Service

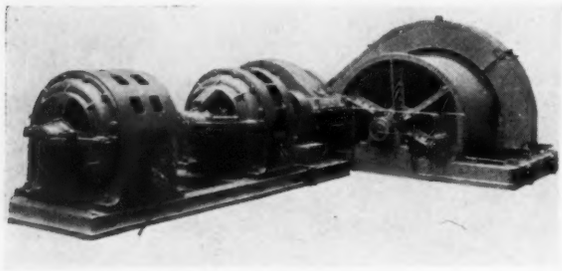


OUR PRODUCTS INCLUDE

Rope Wire
Tinned Wire
Music Spring Wire
Phonograph Needle Wire
Vanadium Wire
Cast Steel Wire
Round Spring Wire
Clock and Motor Springs
Clock and Motor Spring-steel
Paragon Wire
Shade Roller Wire
Band Saw Wire
Flat Heddle Wire
Flat Tempered and Untempered Spring Wires
Cold Rolled Strip, 3″ and narrower

Washburn Wire Co., Inc.

118 St. and Harlem River, New York, N. Y.



Winding unit of hauling apparatus used in connection with car dumper, showing unique motor drive

main motor operated by 2300-volt 3-phase 60-cycle current, with an auxiliary two-speed 440-volt torque motor to give the necessary slow-down. Main and secondary motors are direct connected through herring bone gearing to the mule hauling drum.

Two high-torque squirrel cage motors of 8 horsepower each are used to raise and lower automatically the by-pass gates which allow the mule to travel beneath the railroad tracks on its return journey. This allows the loaded car to be placed in position for the mule to pick it up for placing on the dumper cradle.

Cycle of Operations

The cycle of operation is as follows: With gates in raised position, the mule comes out of its pit at its high speed of 150 feet per minute, through action of the torque motor alone. At the proper moment this motor decelerates to 50 feet per minute to engage the mule with the car, this being accomplished by shifting current to the low speed winding. At this time the main motor is thrown on the line with all secondary resistance inserted, and as soon as the car is engaged by the mule, the torque motor is thrown off the line and the main motor acceler ated to give the full 300-feet per minute mule speed.

As the car approaches the dumper the mule is slowed down by inserting resistance in the secondary circuit of the main motor, and the torque motor is thrown on the line with the high speed winding. This carries the car upon the dumping cradle at a speed of 150 feet per minute. Slowing down and stopping are controlled automatically by limit switches or they can be controlled by the master switch.

At the beginning of the return cycle the track gates are lowered and the main motor is run at full speed until the bottom slow-down is reached. There the main motor is thrown off the line, the mule being driven to the final lower limit by the torque motor on the high speed winding. As soon as the mule reaches the lower limit, the torque motor is thrown off the line and the gates automatically start changing to hoist position.

The apparatus is designed to operate on a 15 per cent grade, and will place 20 cars per hour on the dumper cradle, its maximum capacity being cars of 320,000 pounds loaded weight.

◆

Threading Machine Design Embodies New Features

The Landis Machine Co. Inc., Waynesboro, Pa., has placed on the market a new type of threading machine. This machine is shown in the accompanying illustration.

This machine is made in the single and double head models, and is equipped with heat treated and ground Landis die heads which have tangential chasers. A single pulley drive is provided with a friction clutch to start and stop the machine.

The gear box is of the selective type and gives a range of eight speeds. Speed changes are effected through levers which are conveniently located and easily operated. The bearings and all gears are lubricated automatically by a flood system of lubrication. The double head machines, when equipped with lead screws, have a reversing mechanism in the gear box for reversing one spindle. This mechanism also can be supplied with the non-lead screw machines on special order.

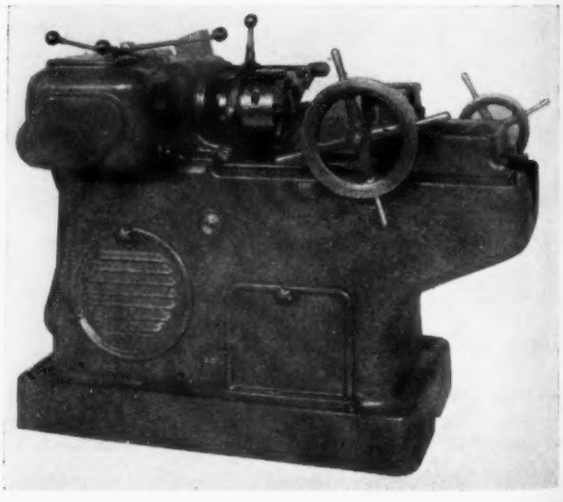
The spindle is driven by spiral bevel gears and its bearings at the die head end are exceptionally large and are pre-loaded to eliminate end play. The die head is placed close to the front spindle bearing to reduce overhang to a minimum. The head is opened through a yoke by the forward movement of the carriage and is closed as the carriage is withdrawn. The yoke also has a lever by which the die head may be opened or closed by hand. The gibbed carriage is operated either by rack and pinion or lever.

Accurate Alignment

The vise has a horizontal as well as a vertical adjustment, which assures extremely accurate alignment between die head and work. The heavy rim of its hand wheel acts as a flywheel to reduce the effort required to grip work. The pump, which is of the low pressure gear type, is direct connected to the gear set constant speed shaft and therefore reverses automatically.

The bed is a one-piece semi-steel casting, reinforced by an inner wall, and provides rigid support for carriage and heatstock. Large drains below the guides and also at the base of the bed return the cutting coolant overflow to the reservoir. The lead-screw, which is optional, is located centrally between the guides of the machine so as to take thrust load without binding the carriage. It is mounted on large pre-loaded ball bearings which eliminate end play. Its coarse pitch thread with rounded crest facilitates engagement of the nut, and assures maximum nut life. It is enclosed in a steel tube to protect it from chips and dirt.

The two segments of the nut are each equivalent to a half-nut and are made exceptionally long to increase their life. They have direct contact with, and take the thrust load of, the carriage, this design relieving the



Rigidity which makes for clean, accurate cutting has been attained in this production threading machine, primarily designed for using tangential chaser die heads

Maintenance Costs Output *with* SUNOCO

undue expansion of the work is prevented. Less power will be required to drive the machine and the work will have a highly polished surface.

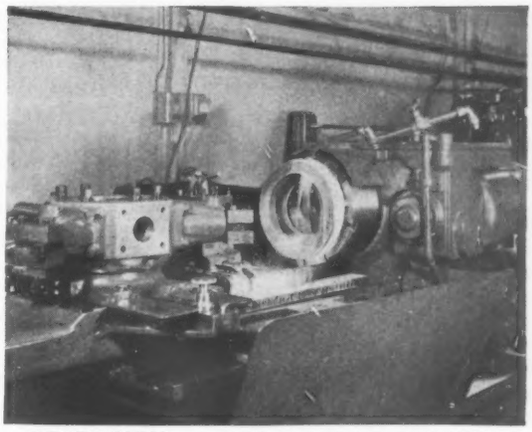
Sunoco is adaptable to all types of boring, turning, facing and grinding operations that require accurate, speedy, economical production.

Sunoco protects finished work from rust and corrosion; is perfect in its emulsion; will not separate; is hygienic; no rancidity after long use.

We cordially offer you the assistance of our widely experienced Cutting Oil Engineers.

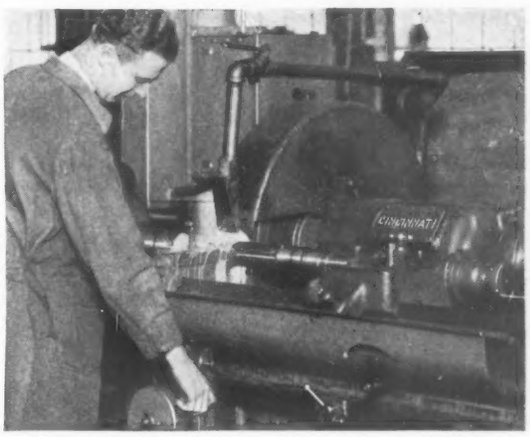
Write any of our many branches, or to our home office.

The Sun Oil Company produces a type of cutting oil to meet every metal-cutting requirement.



Courtesy of The International Machine Tool Co., Indianapolis, Ind.

OPERATION: TURNING, BORING AND FACING TRANSMISSION GEAR BLANK.
MACHINE: 1-H LIBBY LATHE.
TOOLS: CARBOLOY.
MATERIAL: NICKEL STEEL.
STOCK REMOVED: ¼ IN.
SPEED: 94 S. F. P. M.
TIME PER PIECE: 14 MINUTES.
LUBRICANT: 1 PART SUNOCO TO 15 PARTS WATER.



Courtesy of Cincinnati Grinders, Inc., Cincinnati, Ohio

OPERATION: ROUGH GRIND SEVEN SPINDLE DIAMETERS.
MACHINE: CINCINNATI 14 IN. X 48 IN. PLAIN SELF-CONTAINED GRINDER.
MATERIAL: S. A. E. 3145 HEAT-TREATED STEEL.
STOCK REMOVED: .040 IN.
LIMITS: .001 IN. ON ROUGH GRIND.
GRINDING WHEEL: 30 IN. X 3 IN. X 12 IN. ALOXITE 40 N 37.
LUBRICANT: 1 PART SUNOCO TO 40 PARTS WATER.

SUN OIL COMPANY, Ltd., Montreal, Canada.

OCO
CUTTING OIL
of BLUE SUNOCO MOTOR FUEL

mont, Binghamton, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Co- (Mich.), Jacksonville, Miami, Montreal, Newark, New York, Ottawa, Scranton, Syracuse, Tampa, Toledo, Toronto, Trenton, Tulsa, Wilmington.

carrier of all strain. A third adjustable bronze half nut takes up backlash.

Pitch change gears are housed in a box at the headstock end and intermediate gears are carried in a circular slot in the base of this box.

◆

Multiple Spindle Machine Does Three Operations

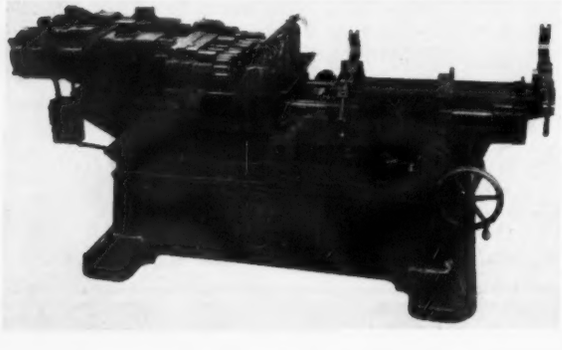
Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman boulevard, Detroit, recently has designed and built a production machine for drilling, reaming and tapping eight holes in a rear axle housing. This machine is shown in the accompanying illustration.

The design comprises two semi-automatic units, one handling drilling operations and step-reaming, and the other handling tapping. The first unit is a 20-spindle head, provided with two horizontal rack guide bars with equalizing pinions and a shaft which eliminate the possibility of misalignment of the unit. The head comprises three banks of spindles, the first bank of eight in the machine illustrated being set to drill 27/64-inch holes, the second group of four drilling holes 29/64-inches in diameter, and a third group of eight spindles being used for step reaming. The eight-spindle tapping head is set to tap eight ½-inch holes in one operation.

Method of Holding Work

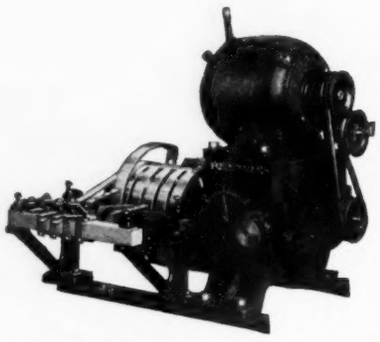
The fixture for holding the work consists of a compound table which is indexed by moving to the right and at the same time to loading position. The work is located in two Vees, is clamped by an adjustable cam, and a central equalizing interrupter is provided so that the part can be tilted to the proper angle when drilling either end. After locating the part, the table is moved to the left to the drilling position, being held there by a jig lock connected directly to the operating handle. Then the drilling unit is started by a convenient pushbutton whereupon the machine goes through its drilling cycle and comes to a stop. Separate control is provided for the drilling unit and for the tapping unit. Upon completion of the drilling operation, the cross slide is indexed to the second drilling position, this cross indexing being accomplished by releasing a plunger in the center of the cross slide and turning the handwheel to the extreme right. The indexing for the two remaining operations is accomplished in a similar manner.

The bushing plate is stationary and is provided with a chip chute fastened directly above a chip pan which is large enough to hold the accumulation of chips over a long run. The bushing plate also carries a manifold with individual nozzles which deliver coolant directly to each cutting point. The coolant returns through the chip pan to a sump in the base of the machine.



Two semiautomatic units of multiple spindle-type are incorporated into this drilling, reaming and tapping machine

◆

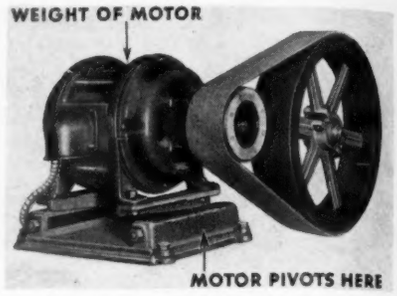


Electrical control is applied to this automatic pressure lubricator

Automatic Lubricator Has Electric Time Control

Reynolds Electric Co., 2650 West Congress street, Chicago, has developed a device which gives automatic pressure lubrication to heavy types of mill equipment which heretofore has received uncertain lubrication. The accompanying illustration shows this lubricator, together with its timer.

When installing this apparatus on operating equipment it is necessary only to make an air line connection to obtain the feeding pressure and an electric line connection to actuate the solenoid control. The lubricator can be set to operate at regular intervals of any given duration, the intervals ranging from once a day to once a week. It is in successful use on blooming mill stands, continuous mill stands, looping mills, and other heavy equipment of this nature.



Proper belt tension is maintained by this short center drive

◆

Short Center Belt Drive Has Automatic Tension

Rockwood Mfg. Co., 1801-2001 English avenue, Indianapolis, has developed a new type of short center drive with flat belt, in which the weight of the motor is utilized to keep the belt at the proper degree of tautness. The accompanying illustration indicates clearly the manner in which this drive operates.

The outfit includes a special pivoted motor base, two pulleys having high coefficient of friction and a special leather belt suitable for use on these pulleys. The motor is mounted on a secondary base which is pivoted to the main base at its front end, leaving the secondary base free to swing on the pivots. The weight of the motor beyond the pivots gives proper tension to the belt at all times and effectively serves to counteract centrifugal force which ordinarily causes shipping, particularly in the case of flat belts running at high speeds.

As mentioned previously special pulleys and belting are used. These pulleys are composed of light material which has longwearing quality and which insures maximum traction between pulley surface and belt.

Six standard bases take care of 60-cycle alternating-current motors ranging from 1 to 50 horsepower with speeds up to 1800 revolutions per minute. Larger sizes and special mountings can be designed to meet customers' specifications.

Pig Iron Rate Rises 19.5 Per Cent

Steelworks Operations Rise to 55 Per Cent—Strip Prices Advanced—Ford Opens Iron Ore Inquiry—Structural Awards Exceed 55,000 Tons

DAILY average pig iron production in February jumped up 19.5 per cent from January. Actual output was at the rate of 61,112 gross tons daily, compared with 55,337 tons in January and 53,732 tons in December. The rate in February, 1930, was 101,640 tons.

Total output in February was 1,711,137 tons, compared with 1,715,443 tons in January and 2,845,937 tons in February last year. Relating production to capacity, February was a 43.3 per cent month, against 39.2 per cent for January.

A net gain of seven active stacks was attained last month, all of them being at steelworks. A similar increase was made in January. At the close of February 109 stacks out of 307 in the country were active.

This improvement in pig iron output foreshadows a similar favorable report when statistics on steel ingot production for February become available next week. Continuation of the gain for steel ingots into March is indicated by an increase of two points in the steel rate this week to approximately 55 per cent. The Chicago district at 55 per cent and Cleveland at 59 are up six points; Pittsburgh at 50 per cent shows a gain of three points; eastern Pennsylvania has advanced a point to 53; Birmingham holds at 65; while Youngstown is the only district to show a reduction, from 50 to 48.

Steel prices for the second quarter still are in an indefinite state. Producers are convinced they merit more remunerative levels but are uncertain that demand, even though rising, warrants an increase. Stripmakers are quoting $1 a ton higher on hot strip, and $2 a ton higher on cold strip for second quarter.

One important maker of plates, shapes and bars at Pittsburgh has quoted 1.65c on the few inquiries thus far submitted for second quarter, but others look for an advance. The price of 1.65c is the nominal quotation on these products for this quarter, with most shipments billed at 1.60c. An important sheetmaker is continuing first quarter prices into the second, while some eastern mills are considering an advance of $2 a ton. An advance for second quarter is contemplated by some makers of plain wire.

March opens with the automotive industry specifying more briskly, demand for structural steel in greater evidence, and several substantial pipe projects coming to the fore. Releases for steel rails and track fastenings are expanding moderately, but the railroads in general are showing comparatively little interest in the market, and requirements of the farm implement industry also remain light.

A heavy volume of miscellaneous inquiry for structural shapes is noted in the Middle West, more than 25,000 tons being pending in Chicago, while 90,000 to 100,000 are in prospect for 90 new school buildings scheduled for this year in the five boroughs of New York. Concrete reinforcing bar demand is improving as spring construction work approaches. Structural steel awards the past week totaled 55,500 tons, compared with 57,705 tons in the week preceding and 26,345 tons in the same week a year ago. Twenty thousand tons of structural shapes have been awarded to Bethlehem Steel Corp., for the Metropolitan Life Insurance building, New York.

Thirty-five thousand tons of pipe is reported placed with the Youngstown Sheet & Tube Co. by the Sinclair-Texas Pipe Line Co., for a 260-mile line from Oklahoma City to East Texas oil fields. An award of 23,000 tons of 24-inch pipe has been made for the Chicago natural gas line through Continental Construction Co.

Inquiry for pig iron for second quarter is slightly more active, and current prices are being named. Foundry coke shipments continue steady. Scrap is quiet, and prices tend to weakness. As usual, the Ford Motor Co. is first in the market for iron ore, its inquiry for 290,000 tons being 40,000 tons less than last year. No change from the 1930 level is anticipated in ore prices.

STEEL's market composite continues unchanged at $31.61 for the third consecutive week.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (March 4, 1931)	**$31.61**
Last week (Feb. 25, 1931)	**31.61**
One month ago (February, 1931)	**31.65**
Three months ago (December, 1930)	**31.74**
One year ago (March, 1930)	**34.95**
Ten years ago (March, 1921)	**45.37**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	March 4, 1931	Feb. 1931	Dec. 1930	Mar. 1930
PIG IRON				
Bessemer, del. Pittsburgh	$18.26	18.51	18.76	20.76
Basic, valley	16.50	16.75	17.00	18.50
Basic, eastern del. eastern Pa.	17.50	17.25	17.50	18.80
No. 2 foundry, del. Pittsburgh	17.76	18.01	18.26	19.76
No. 2 foundry, Chicago	17.50	17.50	17.50	19.50
*Southern No. 2, Birmingham	13.00	13.00	14.00	14.50
**No. 2X, Virginia furnace	18.25	18.25	18.25	18.25
**No. 2X, Eastern del., Phila.	18.26	18.26	18.26	20.76
Malleable, valley	17.00	17.25	17.50	19.00
Malleable, Chicago	17.50	17.50	17.50	19.50
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	25.04
Gray forge, del. Pittsburgh	17.13	17.38	17.63	19.13
Ferromanganese, del. Pittsburgh	89.79	89.79	93.29	103.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $10.50 to $11, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.50	2.50	2.60
Connellsville foundry, ovens	3.25	3.25	3.50	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	30.00	30.00	30.50	33.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	30.50	33.00
Billets, open-hearth, Pittsburgh	30.00	30.00	30.50	33.00
Wire rods, Pittsburgh	35.00	35.00	35.50	38.00

	March 4, 1931	Feb. 1931	Dec. 1930	Mar. 1930
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.65	1.60	1.85
Steel bars, Chicago	1.70	1.70	1.70	1.90
Steel bars, Philadelphia	1.94	1.94	1.89	2.27
Iron bars, Chicago	1.75	1.75	1.70	1.95
Shapes, Pittsburgh	1.60	1.60	1.60	1.80
Shapes, Philadelphia	1.81	1.81	1.76	2.01
Shapes, Chicago	1.70	1.70	1.70	1.90
Tank plates, Pittsburgh	1.65	1.65	1.60	1.85
Tank plates, Philadelphia	1.80½	1.80½	1.80½	2.10
Tank plates, Chicago	1.70	1.70	1.70	1.90
Sheets, blue anl., No. 13, Pitts.	2.05	2.05	2.05	2.25
Sheets, black, No. 24, Pitts.	2.35	2.35	2.35	2.65
Sheets, gal., No. 24, Pittsburgh	2.90	2.90	2.90	3.30
Sheets, black, No. 24, Chicago	2.50	2.50	2.50	2.80
Sheets, blue anl., No. 13, Chicago	2.20	2.20	2.25	2.40
Sheets, galvanized, No. 24, Chi.	3.05	3.05	3.15	3.45
Plain wire, Pittsburgh	2.20	2.20	2.25	2.40
Wire nails, Pittsburgh	1.90	1.90	1.90	2.30
Tin plate, per base box, Pitts.	5.00	5.00	5.00	5.25
SCRAP				
Heavy melting steel, Pitts.	12.75	12.75	12.75	16.60
Heavy melting steel, eastern Pa.	10.50	10.50	11.00	16.25
Heavy melting steel, Chicago	9.75	9.85	10.00	13.20
No. 1 wrought, eastern Pa.	11.00	12.50	13.50	16.25
No. 1 wrought, Chicago	9.00	9.25	10.00	13.50
Rails for rolling, Chicago	12.00	12.10	13.00	15.00

Sheets

New Business in Larger Volume —Automotive Orders Expanding—More Inquiries Appear

SHEET PRICES, PAGE 83

Pittsburgh—Incoming sheet business is heavier and gives a better outlook to March following a rather disappointing February. Neither shipments nor incoming business last month showed a material improvement over January but recent orders for some producers are substantially better than for any week so far this year. Automotive business, in line with operating schedules at motor centers, is expanding gradually but as in the case of requirements of other consumers the amount involved continues restricted. Producers defer formal announcement of second quarter prices. Some inquiry is appearing for that period and where contracts are sought, current quotations are being named. The market is holding fairly well at 2.35c for black sheets, 2.90c for galvanized, 2.05c for 13 gage blue annealed, 1.90c for 9 and 10 gage blue annealed, and 3.30c for autobody. Mill operations show another small improvement with the average for the industry now 45 per cent.

Philadelphia — Early announcement of second quarter prices is expected, with a probability that some sellers will endeavor to obtain an advace of $2 a ton on some items. Current prices are steady. Business is picking up slowly.

Youngstown, O.—A little more activity among sheet consumers has led to a slight increase in the number of sheet mill units active in the district this week. Buyers of common black sheets have placed orders a little more liberally and makers of autobody sheets have received somewhat larger releases. This has resulted in one valley mill operating 100 per cent this week for the first time in many months, the Mahoning Valley Steel Co.'s plant at Niles, O. Common black sheets hold at 2.35c, Pittsburgh; autobody at 3.30c; galvanized at 2.90c to 3.00c, and blue annealed at 1.90c and 2.05c.

Cleveland—Sales and shipments in February were better than in January. Current shipments are steady. There has been some fresh ordering in the past week from the metal furniture group. Autobody releases to the Fisher Body Co. plant here have not been in evidence for some time, though new purchasing is expected shortly. Autobody sheets hold at 3.30c, Pittsburgh, while metal furniture are steady at 3.60c. Black sheets are 2.35c, Pittsburgh. As yet no great interest is manifest by users for second quarter. One seller has tentatively named 3.00c on galvanized for second quarter. Galvanized remain 2.90c.

Cincinnati—Sheet mills report the beginning of seasonal demand for road materials is helping sustain improved production. A Middletown, O., mill again is receiving hot metal from a furnace just put in blast near Hamilton, O.

Chicago—Sheet mills are holding the gains that developed in the three preceding weeks. Whether the increased buying has found a definite trend still is uncertain. Reports are that higher second quarter prices may be announced within a few days. Mill quotations for No. 24 galvanized remain at 3.00c. Operations are over 60 per cent for the district but the ten hot mills at Milwaukee remain down.

St. Louis—Blue annealed and black sheets are moving in larger volume. Prices are firm.

Birmingham, Ala.—Sheet mill operations now are slightly higher than 50 per cent. Demand is expected to improve.

Barton-Warner Co., 414 Chambers street, Sioux City, Iowa, manufacturer of metal culverts, has increased its capital from $50,000 to $150,000. W. G. Warner is president, and T. E. Barton is secretary-treasurer.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.35c
Philadelphia, delivered	2.64c
Gary, Indiana Harbor	2.45c
Chicago, delivered	2.50c
Birmingham, base	2.50c
St. Louis, del.	2.70½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.55c to 2.65c
Gary, base	2.65c to 2.75c

GALVANIZED NO. 24

Pittsburgh, base	2.90c
Philadelphia, delivered	3.19c
Chicago, delivered	3.05c
Gary, Indiana Harbor	3.00c
Birmingham, base	3.05c
St. Louis, del.	3.25½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.05c
Chicago, district mills	2.15c
Chicago, delivered	2.20c
St. Louis, delivered	2.40½c
Philadelphia, delivered	2.34c
Birmingham	2.20c

BLUE ANNEALED SHEETS NO. 9-10

Pittsburgh, base	1.90c
Chicago, district mills	2.00c
Chicago, delivered	2.05c
Philadelphia, delivered	2.19c
St. Louis, delivered	2.25½c
Birmingham	2.05c

AUTOMOBILE NO. 20

Pittsburgh, base	3.30c

FURNITURE NO. 24

Pittsburgh, patent leveled	3.60c

Tin and Terne Plate

Prices per 100 pound box Pittsburgh

Tin plate, coke base	$5.00

Gary, Ind., base 10 cents higher.

(Per pound)

Long ternes, 24, unassorted 3.25c to 3.35c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base

(Per 100 pound keg)

Standard wire nails	$1.90 and 2.00
Cement coated nails	1.90 and 2.00
Galvanized nails	3.90 and 4.00

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.35c and 2.45c
Galvanized wire	2.80c and 2.90c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c to 2.30c
Spring wire	3.20c
Wire, delivered Detroit	2.50c
Nails, delivered Detroit	$2.35

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.80½c to 1.85½c
New York, delivered	1.88c to 1.93c
Boston, delivered	2.00c to 2.05c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Coatesville, Pa., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.05c to 2.15c
St Louis, del	1.95½c

Structural Shapes

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.81c
New York, del.	1.905c
Boston, del.	1.985c to 2.035c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.75c to 1.80c
Birmingham, base	1.75c to 1.80c
Pacific Coast, c.i.f.	2.15c to 2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.60c to 1.65c
Chicago, base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Lackawanna, N. Y., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.25c
Cleveland, base	165c to 1.70c
Philadelphia, del.	1.94c
New York, del.	1.98c
Boston, del.	2.05c
Pittsburgh, cold finish	1.75c to 1.80c
Pittsburgh, forg. qual.	1.85c to 1.90c

RAIL STEEL

Chicago Heights	1.60c to 1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.75c
New York, delivered	1.93c to 2.03c
Philadelphia, delivered	1.89c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet	2.00c
Chi., rail steel	1.60c to 1.70c
Philadelphia, cut lengths	2.19c
Cleveland, cut lengths	1.95c to 2.05c

Cold Finished Steel Bars and Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.10c
Shafting, turned and ground, mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10 Cr.	0.45
2300	1.50	51.00 Cr. spring	0.20
2500	2.25	6100 bars	1.20
3100	0.55	6100 Spring	0.95
3200	1.35	Cr., Ni., Van.	1.50
3300	3.80	Carbon Van.	0.95
3400	3.20	9250 (flats)	0.25
4100 .15 to .25 Mo.	0.50	9250 (rds.,sq.)	0.50
4600 .20 to .30 Mo.			

Strip, Hoops Bands

Hot strip, to 6-in., Pitts.	1.65c to 1.70c
Hot strip 6 1/16 to 24-in. Pitts.	1.55c to 1.60c
Hot strip, bands 6 in. and under, Chicago	1.75c to 1.80c
Do. 6 1/16 to 24 in.	1.65c to 1.70c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do, Chicago	2.00c to 2.10c
Cold rolled strip, Pitts., Cleve., 3 tons, over	2.25c to 2.35c
Worcester, 3 tons, over	2.40c to 2.50c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$36.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts.	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 73 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list ..... 73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off

Tire bolts, 60, 10 and 10 off.

Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.

Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 73 off

HEXAGON CAP SCREWS

Milled ..... 80-10-10-5 off

Upset 1 in. diam. and smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Milled ..... 80-5 off

Upset 1 in. and smaller ..... 80-10-5 off

Upset, larger than 1 in. ..... 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l., Pittsburgh do, less carloads, 5 kegs or over, 2.65c; and less than 5 kegs, 2.80c.	2.40c
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Bars

Slight Improvement in Demand —Small Interest in Second Quarter—Advance Is Hinted

BAR PRICES, PAGE 83

Chicago—February bar shipments are estimated at more than 20 per cent over January. The gain results from automotive, road machinery, deformed bar and miscellaneous demand. Belief in some quarters is that mills will attempt to establish more definitely 1.75c, Chicago, for bars, plates and shapes, through a $1 advance, although mills are making no announcement. Only negligible inquiries for second quarter are noted. Soft steel bar operations are 50 to 55 per cent, and alloy bar mills 45 per cent.

New York—Steel bar demand is virtually unchanged with 1.65c, Pittsburgh, ruling on forward tonnage, and 1.60c, on contracts. February buying showed only a slight gain over January in the experience of one leading seller. Common iron bars are moving sluggishly at 1.60c to 1.70c, Pittsburgh, with the market nearer the inside figure.

Philadelphia—Steel bars are unchanged at 1.65c, Pittsburgh, on forward business with a possibility of advance for second quarter being generally discussed. Although made up of small lots business has expanded slightly. Common iron bars are steady at 1.60c, Pittsburgh.

Pittsburgh—Specifications for steel bars show little further improvement. February business was moderately ahead of that of January, due in a large measure to a pickup in automotive buying. No second quarter price announcement has been made and despite recent rumors it is now regarded as unlikely that an attempt will be made to advance the market for that period above the current 1.65c figure. Second quarter inquiry so far is light, with producers usually quoting 1.65c on new tonnage.

Cleveland—Sellers generally experienced a fair week of sales as February closed. One leading distributor of merchant steel bars in this district suffered an easing off in demand for bars from consuming interests over the past week. February sales totaled greater than January's. The 1.65c to 1.70c, Cleveland base price, holds on purchases for both local and outside deliveries and announcement of second-quarter prices is delayed in almost universal absence of interest in steel for that period.

Western Electric Co., Chicago, reports 1930 sales totaled $361,478,000, compared with a record total of $410,950,000 in 1929, but $73,547,000 ahead of the 1928 total.

Cold-Finished Bars Show But Slight Improvement

Cold Finished Prices, Page 83

Cleveland—Sales of cold-finished steel bars have been fair over the past week with some increases noted in specifications for alloy grades. Cold-finished screw stock has shown a slight expansion in sales. Orders are still small but are becoming a little more frequently received. The market is quotable at 2.00c to 2.10c, Cleveland, base, most 2.00c tonnage having been placed previously on the books.

Pittsburgh — Cold-finished steel bar specifications and shipments show little change since a week ago while a small gain is noted for February over January. Better releases are in prospect for March with increased schedules announced by most automotive interests. Hesitancy still is noted on the part of farm implement builders while a small increase in requirements of other consumers has occurred since the first of the year. Producers defer announcement of second-quarter prices. No change is anticipated in the trade from current market of 2.10c.

Plates

Market Is Quiet—Inquiries for Second Quarter Lacking—Industrial Tank Demand Up

PLATE PRICES, PAGE 83

New York—A further small gain is noted in plate demand. Eastern Steamship Co. has formally awarded two vessels to the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., for which approximately 4600 tons of plates will be required. Plates are 1.70c to 1.75c, Coatesville, Pa. Further locomotive buying includes eight for Chicago, Milwaukee, St. Paul & Pacific and ten tenders for Atchison, Topeka & Santa Fe, both orders going to Baldwin Locomotive Works, Eddystone, Pa., and requiring a total of approximately 600 tons of plates. In addition to five noted last week as awarded to Baldwin, the Russian government has placed five with the American Locomotive Co., this city. The 1400 feet of 66-inch pipe for the municipal Ward island development here is the only pipe job of importance to plate makers pending.

Close to 1000 tons of plates will be required for two carfloat barges for the Inland Waterways Corp., bids to be opened March 9.

The Standard Shipping Co., a Standard Oil subsidiary, has awarded two barges to the Sun Shipbuilding Co., requiring an aggregate of 3000 tons of steel, and is inquiring for two tank barges requiring a total of 2000 tons. About two-thirds of these tonnages will be plates.

Philadelphia — Approximately 10,000 tons of plates were awarded in the past week for ship construction. Five thousand tons for a cruiser were placed with two leading mills, and 4600 tons for two Eastern Steamship Co., vessels were placed with one mill by the Newport News Shipbuilding & Dry Dock Co.

Pittsburgh—Plate business showed little change during February and currently is restricted by quietness in line pipe and freight car construction. Shipbuilding is taking fair tonnages while barge business continues dull.

Cleveland — Inquiry is plentiful but generally for small lots. The current price of 1.65c, Pittsburgh, is reported held on forward purchasing. Some interest has been shown in the past week by manufacturers of concrete-mixing machinery, steam power shovels, and general road machinery. Current steel plate sales are fair. A trend to heavy flanged and dished heads for tanks, boilers and stills has become evident. Producers withhold announcement of a second quarter price, but do so in part from lack of inquiry by consumers. Thunder Bay Quarries Co., subsidiary of Diamond Alkali Co., Fairport, O., will take approximately 1000 tons of sheet piling for docks to be built at Alpena, Mich.

Chicago—Plate mills are barely holding 50 per cent as the result of further recently reduced skelp shipments to Milwaukee for line pipe. Storage tank orders total 2000 tons.

The oil tank market is quiet, but boiler and industrial tank demand is up. Plates remain at 1.70c, base Chicago. No price announcement has been made for second quarter, as inquiry for that period is light.

Contracts Pending

1000 tons, two car floats, Inland Waterways Corp.; bids March 9.
210 tons, 20-inch welded steel pipe, East bay municipal utility district, Oakland, Calif., bids March 11.
200 tons, 2 barges, for United States Engineers, Pittsburgh district; Dravo Contracting Co., low bidder.

Operating Rate Forges Ahead, Especially Chicago

Youngstown, O.—Steel ingot production is down two points this week to 48 per cent capacity, the first weekly loss of the year and after a flat 50 per cent operating level was maintained for each of four weeks of February. Open-hearth production embraces 26 active independent furnaces, compared with 28 last week; Corporation open hearths continue at 50 per cent. Bessemer steel production is higher.

Philadelphia — Eastern ingot operations are up fractionally to approximately 53 per cent capacity with a leading mill holding unchanged at approximately 56 per cent. Calculations do not include the Eastern Steel Co., Pottsville, Pa., whose operations have been suspended by receivers pending reorganization.

Pittsburgh—Steel ingot production is up two points at slightly below 50 per cent. Steel works now are operating 21 of 54 blast furnaces, representing a net gain of two active stacks since Jan. 31. Finishing mill schedules generally are steady.

Cleveland—Ingot operations are up six points this week to 59 per cent of capacity with the addition of two open hearths, now making the active furnaces 20 of 34.

Chicago—Chicago district's ingot operations have reached 55 per cent, against 49 per cent a week ago. A leading producer has two 150-ton open-hearth furnaces in operation of the seven new ones just completed at Gary. Inland Steel Co. has blown in a blast furnace that has been idle for over eight months, making three in blast for that producer at Indiana Harbor. Fifteen of the 36 steelworks blast furnaces in the district are active. Finishing mills are unchanged, except sheet mills are up 5 points, to over 60 per cent.

Birmingham, Ala. — Operations hold at 65 per cent of capacity. Sixteen of 23 open-hearth furnaces are producing ingots.

Railroads

Rail Releases Expand at Western Mills—Rail Inquiry Absent and Equipment Market is Dull

TRACK MATERIAL PRICES, PAGE 83

New York—With only seven freight cars noted as placed, indications are that February bookings were one of the lightest in history. This follows an exceedingly dull January when approximately 100 cars were awarded. Dullness at car shops is particularly pronounced in view of the light caryover from 1930, only 9820 cars being on order Jan. 1, 1930. It is believed bookings of the past two months have been the lightest for any corresponding period on record.

Cleveland—Nickel Plate still defers action on definite allocation of its 27,400 tons of rails. Its tie plates, fastenings, etc., will not be awarded until April. The reputed inquiry of the Nickel Plate for ten locomotives is without backing.

Fairport, Painesville & Eastern railroad petition to the interstate commerce commission to extend its line to Austin, O., has been denied, but extension to Shale, O., amounting to a nine-mile addition has been granted. Re-rolled rails are being used but the road will purchase fastenings for the extension.

Philadelphia—Norfolk & Western is inquiring for 5000 tons of plates, shapes and bars for repairs to 500 hopper cars. Including 500 tons previously noted, over 1000 tons of plates, shapes and bars are now required for locomotives recently booked by Baldwin Locomotive Works, Eddystone, Pa.

Pittsburgh — Specifications for track material are moderately heavier than a month ago although the increase has been of no more than seasonal proportions and business generally is quiet. Few inquiries remain pending in the market and little new business is appearing. Formal announcement is awaited on the inquiry of the Bessemer & Lake Erie railroad for 1200 cars although it is understood the order has been allocated. Light rails continue quiet.

Chicago—Releases for steel rails are improving. Chicago district rail mill operations are being maintained at 55 per cent. No important inquiry is noted. Further buying is expected to be light until mills absorb more of the carryover from 1930, and until they complete trackage for which rails already have been laid down. Track fastening sales total 5000 tons, a drop from recent weeks, although releases have gained. The car equipment market is devoid of interest. Northern Pacific is purchasing 1500 tons of steel for 500 underframes which will be built in the road's shops.

The Chicago & Eastern Illinois will retire 7286 miscellaneous freight cars. Of these, 286 gondolas are now being scrapped. An attempt will be made to sell the remaining 7000.

Toronto, Ont.—Dominion Steel & Coal Corp., Sydney, N. S., has begun rolling of 2000 tons of 127-pound rails for Canadian lines of the Michigan Central railroad.

Car Orders Placed

Northern Pacific, 1500 tons of finished steel for 500 underframes to be built in road's own shops.
Norfolk & Western, rebuilding of 500 all-steel hopper coal cars, to own shops in Roanoke, Va.

Locomotives Placed

Atchison, Topeka & Santa Fe., 10 tenders, to Baldwin Locomotive Works, Eddystone, Pa.
Chicago, Milwaukee, St. Paul & Pacific, eight passenger locomotives, to Baldwin Locomotive Works, Eddystone, Pa.; action on the remainder of the original list for 54 locomotives has been definitely postponed.
Soviet Russia, five locomotives, to American Locomotive Co, New York; these are in addition to five reported last week as going to Baldwin Locomotive Works, Eddystone, Pa.

Rail Orders Placed

Western Pacific, 10,350 tons, 110-pound rails, to Colorado Fuel & Iron Co., Denver.

Car Orders Pending

Chicago Tank Car Co., one 10,000-gallon tank car.

Locomotives Pending

Louisiana & Arkansas railroad, two 2-8-2 type locomotives.

Capitol Dome Is Cast Iron

Of less weight than the domes of St. Peters in Rome and St. Pauls in London, the dome of the capitol at Washington is entirely of cast iron, Gray Iron Institute Inc., Cleveland, points out in the initial bulletin of a new series. The iron totals about 4000 tons and the largest casting weighs 10 tons. The dome was completed in 1870 after having been delayed many years by the Civil war.

Structural Shapes

Public Construction in New York District Is Active—Miscellaneous Inquiry in West Aggregates 25,000 Tons—Awards Above Average at 40,546 Tons

STRUCTURAL SHAPE PRICES, PAGE 83

New York—Fabricated steel prices are slow to reflect the firmer price stand on plain material taken by mills. Bulk of such volume placed in the first quarter has been based on plain material prices before the $1 a ton increase announced late last year. Little, if any, contracting has been done for second quarter. New construction is still confined largely to public work. Bids are in on close to 2000 tons for bridges in New Jersey. The building program for New York City continues to expand, especially schools and hospitals. Plans have been made for the construction of approximately 90 new school buildings in the five boroughs of New York during the next year. Estimates placed the steel needs for this program between 90,000 and 100,000 tons. Bids are in on a new pier, No. 32, and proposals will be made for two more in the near future. These are the first of the 1000-foot piers recently authorized by the war department.

Boston—Pending contracts are for 100 tons for a state bridge in Vermont and 300 tons for three state bridges in Connecticut.

Philadelphia—While there is considerable work on fabricators' boards, much of it continues to be held up pending more adequate financing. Few new projects have come out and awards are scattered. On new tonnage the usual price is 1.75c, mill, or 1.81c, Philadelphia. Contracts are moving at 1.70c, mill.

Pittsburgh—Fabricated structural steel is quiet in awards but fairly active in inquiries for small lots. Large projects are lacking in new business. Operations of fabricators remain at the lowest level of the year. The market is untested on plain material with 1.65c, Pittsburgh, the usual quotation. Announcement is lacking on second-quarter market.

Cleveland—Much interest has centered on opening of bids for the 57 United States government hangars, bids for which were closed Feb. 27. Some 11,000 tons of structural shapes are involved and 32 bidders reveal a wide discrepancy through the list on work, proposals varying as much as 50 per cent from low to high on a given hangar.

Bids go in March 6 for 300 tons of shapes for West Third street bridges for the city. Bids were to be opened March 4 for the John Carroll university general contract Ohio Salt Co. will take 180 tons for a plant at Wadsworth, O. Odd Fellows hall at Bradford, Pa., will also take 180 tons. Local structural awards of any size are conspicuously absent, a 37-ton addition to St. Paul's school being the largest award of the week.

Chicago—Miscellaneous structural inquiry is voluminous, without furnishing substantial backlogs to the mills. Including also Chicago sanitary district work, about $54,000,000 in park, lake front and transportation improvement bonds was approved at the recent Chicago primaries. Plain material remains at 1.70c to 1.75c, Chicago. Inquiry, including a number of bridge projects and airplane hangars in the west, is over 25,000 tons. Chicago Rapid Transit Co. will inquire soon for third track elevated structures for its Garfield Park division, 9000 tons. A second Twin City lock for the United States engineer at St. Paul will be out shortly.

Birmingham, Ala. — Operating schedules in fabricating shops are being increased. New business is coming in at same pace that deliveries are being made.

Contracts Placed

20,000 tons, 28-story office building, Fourth avenue from 24th to 25th street, New York, for Metropolitan Life Insurance Co., to Bethlehem Steel Co., Bethlehem, Pa., through Starrett Bros. & Eken Inc., New York, general contractor.

8300 tons, continuous sheet mill building, for Inland Steel Co., Indiana Harbor, Ind., to eleven unstated Chicago district fabricators. Included was 2100 tons to McClintic-Marshall Corp., Bethlehem, Pa.

2100 tons, office building, Ramsay Building Co., Oklahoma City, Okla., to American Bridge Co., Pittsburgh. Starrett Construction Co., New York, general contractors.

1500 tons, highway bridge, Coushatta, La., to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

1400 tons, grandstands, Ebbetts field, Brooklyn National League Baseball club, Brooklyn, N .Y., to George A. Just Co., Long Island City, N. Y.; William Kennedy Construction Co., general contractor.

1000 tons, Royal Ontario Museum addition, Toronto, Ont., to Dominion Bridge Co., Montreal, Que.

705 tons, intake steel, for Safe Harbor Water Power Corp., Safe Harbor, Pa., to Belmont Iron Works, Philadelphia; in addition to 585 tons for power house superstructure noted last week in STEEL as going to American Bridge Co., Pittsburgh.

700 tons, coal cleaning plant, Gravel Switch, Ky., to Indiana Bridge Co., Muncie, Ind.

500 tons, toll bridge, Frenchtown, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

500 tons, bridge, Gun Powder Falls, Baltimore, to American Bridge Co., Pittsburgh.

475 tons, nurses' home, Isolation hospital, Brooklyn, N. Y., to B. Schacht & Son, Bronx; Hudson Construction Co., general contractor.

400 tons, theater, Hackensack, N. J., to F. G. Schaefer Iron Works Co., Edgewater, N. J.

350 tons, Wisconsin state highway work, to Wisconsin Bridge & Iron Co., North Milwaukee, Wis.

300 tons, building, Unadilla Valley railroad, New York, to Belmont Iron Works, Philadelphia.

275 tons, remodeling warehouse, Jay street, Brooklyn, N. Y., to Fort Pitt Bridge Works Co., Pittsburgh.

195 tons, addition to National Life building, Fort Wayne, Ind., to Massillon Bridge & Structural Co., Massillon, O.

190 tons, Chevrolet motor and bumper plant, Detroit, to McClintic-Marshall Corp., Bethlehem, Pa.

175 tons, building, Corliss Creamery Co., Pittsburgh, to Levinson Steel Co., Pittsburgh.

150 tons, courthouse, Queens, N. Y., to Kues Bros. Iron Works, Bronx, N. Y.

141 tons, two bridges over Elk creek, Portland, Oreg., to unstated company.

140 tons, two apartments, Boynton avenue, Bronx, N. Y., to Cosmic Iron Works, Bronx.

110 tons, repairs to Halsted street bridge, Chicago, to Hansell-Elcock Co., Chicago.

100 tons, two apartments, Webster and Morris avenues, to Le Brox Iron Works, Bronx, N. Y.

100 tons, apartment, Ocean parkway, Brooklyn, to Diamond Iron Works, Brooklyn, N. Y.

100 tons, ice plant, Lexington avenue, Brooklyn, N. Y., to Reiche & Penner, Brooklyn, N. Y.

100 tons, bridge, Elkins Park, Pa., for Reading Company, to McClintic-Marshall Corp., Bethlehem, Pa.

100 tons, apartment, Kosuth avenue and 210th street, Bronx, N. Y., to World Iron Works.

100 tons, veterans' hospital, Iowa City, Iowa, to unstated fabricator.

Awards Compared

	Tons
Awards this week	**40,546**
Awards last week	**57,705**
Awards two weeks ago	**10,361**
Awards this week in 1930	**26,345**
Av. weekly awards, 1930	**35,242**
Av. weekly awards, 1931	**28,227**
Av. weekly awards, Feb.	**26,659**
Total awards to date, 1930	**340,304**
Total awards to date, 1931	**282,270**

100 tons, post office, Pomona, Calif., to Minneapolis-Moline Power Implement Co., Los Angeles.
100 tons, bulk material crane for Pioneer Sand & Gravel Co., Seattle, to Washington Iron Works, Seattle.

Contracts Pending

21,500 tons shapes, 745 tons steel castings and 12,510 lineal feet railing, highway viaduct, Newark avenue to easterly shore line, Hackensack river, Jersey City, route 25, connecting link, section 2, American Bridge Co., Pittsburgh, low at $2,522,870.50.
15,000 tons, airplane hangars in the West and Southwest.
11,000 tons, 57 hangars for United States government, bids were received Feb. 27. Thirty-two bidders participated, Ingalls Iron Works, Birmingham, Ala., and Belmont Iron Works, Philadelphia, were low on several items, bids for which have been opened. Included in 11,000 tons is 3000 tons of J. & L. junior beams.
9000 tons, estimated, third track elevated structure for Garfield Park division, Chicago Rapid Transit Co., Chicago.
6500 tons, city work for St. Louis, including municipal bridge approach.
5500 tons, war memorial, San Francisco, Calif.
1700 tons, bridgework, State of Iowa.
1500 tons, Safe Harbor hydroelectric project, Safe Harbor, Pa., additional inquiry to recent award to 600 tons to American Bridge Co., Pittsburgh, and this week's award of 705 tons for intake steel to Belmont Iron Works, Philadelphia.
1200 tons, East Boston to Boston vehicular tunnel, in addition to 12,000 tons fabricated plates as noted in STEEL for Feb. 5; bids close March 4.
1000 tons, highway bridges, Delaware.
800 tons, highway bridge in Nebraska.
800 tons, highway bridges in Texas.
600 tons, stadium, Oklahoma A. & M. college, Stillwater, Okla.; plans ready shortly.
500 tons, bridgework, State of Minnesota.
500 tons, bridge spans for Chicago, Burlington & Quincy railroad.
450 tons, two transmission towers, Panama; bids in.
400 tons, bridgework, State of Illinois.
400 tons, two car floats, Inland Waterways Corp.; bids March 9.
300 tons, bridge over Islais creek, San Francisco; bids March 25.
300 tons, three state bridges, Connecticut.
275 tons, hangars, county airport, Pittsburgh.
250 tons, science building, San Francisco, Dyer Bros., San Francisco, low.
225 tons, Lawe street bridge, Kaukauna, Wis.; bids close March 12.
225 tons, subway for city council, Saskatoon, Sask.
180 tons, plant addition for Ohio Salt Co., Wadsworth, O.
180 tons, Odd Fellows building, Bradford, Pa.
176 tons, Junior high school, High Point, N. C.; general contract to R. K. Stewart & Son, High Point, N. C. Also includes 35 tons of reinforcing bars.
140 tons, bridges, route 4, section 3, Grand and Broad avenues, Englewood, N. J., to unstated fabricator.
125 tons, federal bridge, Mount Baker park, Wash.; bids in.
125 tons, state highway bridges, Sauk county, Wis.; bids close March 10.
110 tons, bridge over Lytle creek, Sacramento, Calif.; bids March 18.
100 tons, state bridge, Vermont.

Concrete Bars

Chicago District Has 12,000-13,000 Tons Actively Pending—Week's Largest Award Is 4500 Tons at Chicago—Prices Shaded in East on Large Lots

REINFORCING BAR PRICES, PAGE 83

Chicago—Reinforcing bar inquiry has picked up. About 12,000 to 13,000 tons is active including 1400 tons for the Soo line ore dock, at Marquette, Mich.; 1200 tons, filtration plant at Ft. Wayne, Ind.; 800 tons, Wells school, Chicago; 500 tons, Swayne apartments, Chicago; a 500-ton department store; and 200 tons, wholesale house for Reid, Murdoch & Co., Pierceton, Ind. The 5000 tons for the Chicago sanitary district sewage treatment works has become active through the favorable vote at the Feb. 24 elections, and the general contract has been let to a Detroit firm. The 2.00c price for billet bars is being shaded. For the Ogden avenue improvement, 4500 tons additional has been let.

Boston—Some 650 tons of concrete bars were awarded in the past week. For a telephone building at Holyoke, Mass., 125 tons were taken by the Concrete Steel Co. and 126 tons more by the same producer for a newspaper plant at Manchester, N. H. Kalman Steel Co. was awarded 300 tons for a steam plant in Boston while some odd lots aggregated another 100 tons.

New York—Concrete reinforcing bars are being shaded on large lots, but mills are taking a firmer stand at 1.65c, Pittsburgh, on stock lengths. Prices are firm on small shipments. Public work calls for the bulk of business, awards being made of 900 tons for the westside elevated highway through James Stewart & Co. to the National Bridge Co. Two subway sections, 980 tons, were also placed. Barracks at Langley Field, Va., will take 700 tons. Bids went in this week on about 1000 tons for New Jersey highways and bridges.

Philadelphia — Reinforcing bars are steady at 1.65c, Pittsburgh, or 2.30c, delivered locally by truck. While several fair sized tonnages are active, little has been closed.

Pittsburgh—February business in reinforcing bars held at about the January rate with prospects favorable for an upturn during March. Milder weather recently has stimulated specifications against old orders. Booth & Flinn Co. is low bidder on substructure for the Pittsburgh post office foundation requiring 850 tons.

Cleveland—General contract bids on the John Carroll university project were delayed one day and were to be received March 4. Successful general contractor will award the steel. Awards in this district are small, under 100 tons this week, and not numerous. There is little up for figuring.

Birmingham, Ala.—Several specifications are in sight, including road and building work throughout the South. Louisiana is sending out specifications on several road and bridge contracts which requiring bars.

Awards Compared

	Tons
Awards this week	**11,291**
Awards last week	**3,055**
Awards two weeks ago	**6,498**
Awards this week in 1930	**5,996**
Av. weekly awards, 1930	**6,990**
Av. weekly awards, 1931	**6,895**
Av. weekly awards, Feb.	**5,251**
Total awards to date, 1930	**49,330**
Total awards to date, 1931	**68,948**

Contracts Placed

4500 tons, Ogden avenue improvement, Chicago, to American System of Reinforcing, Chicago, and six other fabricators, through Great Lakes Dredge & Dock Co., in addition to 3000 tons previously awarded, making a total of 7500 tons.
2000 tons, Illinois roadwork, to several unstated fabricators.
980 tons, two subway sections, route 108, sections 10 and 11, Queens, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Triest Contracting Co., general contractor.
850 tons, West Side elevated highway, Fifty-ninth to Seventy-second street, New York, to National Bridge Co., Long Island City, N. Y.; James Stewart & Co., general contractor.
660 tons, Firmin Desloge hospital, medical department, St. Louis university, to Laclede Steel Co., St. Louis.
600 tons, subway, section 3, Newark, to Igoe Bros., Newark, N. J.; Thomas Crimmins Co., general contractor. Previously reported going to another distributor.
300 tons, Edison electric steam plant, Boston, to Kalman Steel Co., Chicago.
240 tons, paving, San Joaquin county, Calif., to unstated company.
225 tons, office building, Ramsay Building Co., Oklahoma City, Okla., to

(*Concluded on Page 91*)

Strip

Advance of $1 on Hot-Rolled and $2 on Cold Fairly General for Second Quarter Contracts

STRIP PRICES, PAGE 83

Pittsburgh — Strip producers have opened books for second quarter at an advance of $1 a ton on hot strip and $2 a ton on cold strip over current levels. New prices would be 1.70c for narrow hot strip, 1.60c for wide material, and 2.35c for cold-rolled strip. These figures have applied on some small lots this quarter, but most tonnage has been placed at lower levels. Incoming business is holding well at the sharply improved rate of recent weeks, February orders for one producer being reported as the best in more than a year. Mill operations hold around 50 to 55 per cent for hot mills, with cold strip production ranging up to 50 per cent.

New York—One producer of strip steel has advanced prices, effective at once, quoting hot strip at 1.60c, Pittsburgh, on wide, and 1.70c, on narrow, an advance of $1 a ton in both cases. Cold-rolled has been increased $2 a ton, to 2.35c, Pittsburgh, minimum. Similar action by other producers is expected. One maker has withdrawn prices, indicating that an upward revision is imminent. Demand remains spotty, although the general volume is better than a fortnight ago.

Philadelphia—While some producers still are to be heard from, several have announced advances of $1 on hot-rolled strip and $2 on cold-rolled. Meanwhile 1.55c, Pittsburgh, is available on wide hot-rolled and 1.65c on narrow, with 2.25c, Pittsburgh, on cold-rolled. Trading in strip continues unrestricted.

Youngstown, O.—While makers of both hot and cold-rolled strip are greatly interested to learn of advances of $1 in hot and $2 on cold-rolled material made in adjoining territory, they reluctantly admit as yet they are not following the advance. They hope that requirements in the immediate future may permit them to act similarly. However, at the moment quotations on both hot and cold-rolled strip are unchanged from previous levels.

Cleveland—Sales of strip the past week have been encouraging, especially demand from automobile interests, where releases have been expanding. Though the move awaits a united backing, several important producers of strip have named higher second-quarter prices, which are now for that period: 1.70c and 1.60c, Pittsburgh, for narrow and wide hot strip, respectively; and 2.35c, Pittsburgh and Cleveland base, on cold-rolled strip. This represents an advance of $1 on hot and $2 on cold strip over current quotations of 1.55c and 1.65c, Pittsburgh, for narrow and wide hot, respectively; and 2.25c, Pittsburgh and Cleveland, on cold.

Chicago — Hot-rolled strip producers are advancing prices $1 a ton for second quarter. The top price for the narrow widths under the new schedule is 1.80c, Chicago, while 6 1/16-inch to 24-inch hot-rolled strip is 1.70c. Cold-rolled prices also are named on a 2.35c, Pittsburgh-Cleveland basis, which would amount to an increase of approximately $2 a ton. Strip prices have held firmly in recent weeks, as orders have been gradually improving. Hot-rolled operations are 40 to 45 per cent, while cold-rolled activity is about 35 per cent. Miscellaneous orders in hot-rolled have been gaining in slightly greater proportion than automotive business. The automotive frame builder at Milwaukee has increased shipments.

Warehouse Sales Still Small, Lacking Improvement

Warehouse Prices, Page 105

New York—Jobbers are looking forward to improved activity this month particularly in view of more extended building operations. The February rate was about comparable with January; total volume, however, was less because of fewer working days. Prices are unchanged.

Boston—Warehouses continue to get a small amount of business. In the past two or three weeks this has dwindled considerably and is not showing any betterment as yet.

Philadelphia — Jobbers report a continued slight gain in the daily rate of business. Prospects are for a more substantial improvement as March gets underway. Prices are unchanged.

Buffalo — Warehouse demand is holding to recently established levels. Building steel is moving more briskly and promises to show further betterment this month.

Pittsburgh—Movement from warehouses still is slow to expand. A few products are in moderately better demand than a month ago although total improvement since January has been slight. Prices are unchanged and generally steady.

Cleveland—Jobbers report movement of sheets and strip somewhat higher than the rate of recent weeks. Plates continue in fair volume and orders for manufacturers' wire are appearing regularly. Structurals continue slow. Prices are firm and unchanged.

Detroit—Volume of orders is fair, with an occasional large-sized order included. Prices are unchanged.

Cincinnati — Warehouse tonnage for February was little heavier than for January, size of individual orders causing disappointment. Prices are unchanged.

Chicago—Recent gains in warehouse orders are being held. Sales have picked up each week for the last 30 days until the closing of February, when the usual month-end decline occurred. Demand is well diversified, except that sheet buyers are less active. Prices are steady in the Chicago district. St. Paul prices for hoops now are 3.75c instead of 3.70c.

St. Louis—The unusually favorable weather for outside construction has helped iron and steel warehouses. With the exception of galvanized descriptions, demand for sheets has shown steady improvement, and tank plates also has been better.

Semifinished Inquiries for Second Quarter Lacking

Semifinished Prices, Page 94

Pittsburgh—Shipments of semifinished steel showed a small increase during February as the result of better operations of finishing mills. New business continues in small lots with no interest in quarterly contracts. Producers have announced no prices for second quarter, the market remaining $30 for rerolling billets, slabs and sheet bars and forging billets continuing $36. In some quarters an advance is looked for over the current $35 price of wire rods.

Youngstown, O.—Users of semifinished steel have not put out inquiries for second quarter. Consumers feel sure the market will not change against them soon, nor have they any doubt they can get supplies when required. Billets, sheet bars and slabs are steady at $31, Youngstown and Pittsburgh.

Chicago—Semifinished steel sales are light. Virtually no inquiries are noted for second quarter. In the absence of active selling quotations are nominal at $31, Chicago, for billets and blooms, 4 x 4-inch base. Forging billets are based on $36, Chicago.

Concrete Bars

(*Concluded from Page 87*)

American Bridge Co., Pittsburgh. Starrett Construction Co., New York, general contractor.

200 tons, school, Milwaukee, to Kalman Steel Co., Chicago.

190 tons, Veterans hospital at Gulf Port, Miss., through H. B. Ryan Construction Co., Chicago.

150 tons, high school, Pasadena, Calif., to unstated company.

150 tons, Turtle Creek overhead and bridge, Beloit, Wis., to Hansen, Beckman & Co., Rockford, Ill.

126 tons, newspaper plant, Manchester, N. H., to Concrete Steel Co., New York.

126 tons, bridge on Benson-Douglas highway, Phoenix, Ariz., to unstated company.

125 tons, Stonewall Jackson school, Oklahoma City, Okla., to Capitol Steel & Iron Co., Oklahoma City, Okla. Project also includes 60 tons structural steel.

125 tons, bridges, route 4, section 3, Grand and Broad avenues, Englewood, N. J., to Concrete Steel Co., New York, through Brooks Bros. Inc., Paterson, N. J., general contractor.

125 tons, telephone building, Holyoke, Mass., to Concrete Steel Co., New York.

100 tons, work for United States engineers, Milwaukee, to Inland Steel Co., Chicago.

100 tons, tunnel connections, Brentwood hospital, Long Island, to Kalman Steel Co., Chicago, through Brady Concrete Co., general contractor.

100 tons, post office, Pomona, Calif., to unstated company.

100 tons or more, state bridge near Waitsburg, Wash., to unnamed interests; general contract to Fred and Harold Lockyear, Portland, Oreg.

100 tons or more, bridge over Fall river, Fremont county, Idaho, to unnamed interests; general contract to Gabbey & McNeill, Boise, Idaho.

100 tons or more, state bridge over Tahkenitch river, Douglas county, Oregon, to unnamed interests; general contract to Tom Lillebo, Reedsport, Oreg.

Unstated tonnage, 100 tons or more, for penitentiary, Lewisburg, Pa., to Sweet's Steel Co., Williamsport, Pa.; Great Lakes Construction Co., Chicago, general contractor.

Contracts Pending

5000 tons, Chicago sanitary district sewage disposal plant, Stickney, Ill.; general contract to S. A. Healy Co., Detroit, at $2,687,463.

4000 tons, Sixth street, bridge, Los Angeles; bids March 25.

2000 rods, reinforcing rods, vehicular tunnel from Boston to East Boston, in addition to 12,000 tons of fabricated plates as noted in STEEL for Feb. 5; bids close March 4.

1400 tons, ore dock, for Soo Line railroad, Marquette, Mich.

1200 tons, filtration plant, Ft. Wayne, Ind.

850 tons, Pittsburgh post office substructure; Booth & Flinn Co., Pittsburgh, low bidder on general contract.

800 tons, Wells school, Chicago.

700 tons, four barracks, Langley field, Va.; Batson-Cook Co., West Point, Ga., general contractor.

650 tons, bridge over Arkansas river, Tulsa, Okla.; plans ready shortly.

500 tons, Swayne apartments, Chicago.

500 tons, Wieboldt department store, Chicago.

400 tons, highways, also one small span bridge, New Jersey State highway commission, bids March 16. Work included in two contracts, route 22, section 1, Cranford, Union county; second, route 29, sections 1 A and 2 A, Union county.

290 tons, Lawe street bridge at Kaukauna, Wis.; bids close March 12.

200 tons, wholesale house for Reid, Murdoch & Co., Pierceton, Ind.

150 tons, stadium, Oklahoma A. & M. college, Stillwater, Okla.; plans ready shortly.

145 tons, Boston, foundations for Massachusetts Institute of Technology units.

108 tons, paving in Mendocino county, Calif.; bids March 18.

Pipe

Steel Pipe Makers Hopeful for Line Pipe Work—Cast Grades More Active in the West

PIPE PRICES, PAGE 105

New York—Three foundries will divide 3300 tons for yard stock for Bronx, N. Y. Prices were none too strong in view of the fact hauling and stacking are included in the contracts. Bids go in March 6 on 3840 tons, 4 to 20-inch, 500 tons of fittings and 400 hydrants for Queens yard stocks. Two contractors lettings to be open March 10 call for 1800 tons of 6 and 20-inch. Warren Foundry & Pipe Co. has booked close to 3000 tons for Brooklyn, N. Y., and the Brentwood hospital project, Long Island. The North Central Gas inquiry for 30,000 tons still is pending. Texas Co. has withdrawn inquiry for approximately 2000 tons of steel pipe, bids having been asked for estimating purposes.

Boston—Some fairly sizable contracts were closed in this territory in the past week, aggregating 5000 tons of various sizes. One of the public utility companies placed 15,000 feet of 6-inch pipe and 2700 feet of 4-inch pipe. Warren Foundry & Pipe Co. is low bidder on 300 tons wanted by Medford, Mass., of 6 and 8-inch pipe, while Brockton, Mass., is coming into the market for 2200 tons of various sizes. Prices continue firm.

Philadelphia—Butt and lap-weld pipe is moving slowly with jobbers of these and other plumbing supplies reporting the first two months of 1931 the poorest in years.

Pittsburgh — Pipe producers are placing most of their hopes for better business upon prospective line pipe work. What expansion is noted in operations over the past 30 days has resulted mostly from the few line pipe orders placed so far this year, with buttweld pipe and oil country goods continuing very dull. The line of the North Central Gas Co. is expected to be placed within the next few days. Mechanical tubing and locomotive and boiler tubes are in better demand than a month ago.

Youngstown, O. — Youngstown Sheet & Tube Co., Youngstown, O., is reported to have been awarded 35,000 tons of steel pipe, 12-inch, for a 265-mile pipe line from Oklahoma City, Okla., to the East Texas fields for Sinclair Texas Pipe Line Co., Tulsa, Okla. Line will have five pump stations, probably electrically- equipped, and its capacity will be 65,000 barrels daily.

Chicago—Cast pipe is becoming more active. Prices are regarded as steady for private work at $45.20 to $46.20, delivered Chicago, for the larger diameters, but concessions occur for some of the municipal work which still is relatively light. Chicago took bids March 2 for 16,000 tons. Columbus, O., has let 2000 tons. About 6000 to 8000 tons for public utilities has just been closed.

Birmingham, Ala.—Lettings have slowed but backlogs are not being cut into deeply. Operations in this section are at 70 per cent capacity.

Contracts Placed

15,000 feet, Boston, 6-inch, by a Massachusetts public utility, to Warren Foundry & Pipe Co., Phillipsburgh, N. J.

3300 tons, 6 to 30-inch, mostly 8-inch, yard stocks, Bronx, N. Y., bids Feb. 24, distributed as follows: 1020 tons 8-inch, to Donaldson Iron Works, Emaus, Pa., $41.60; 1210 tons, to R. D. Wood & Co., Philadelphia, on bids of $40, $39.25 and $41.45; 1050 tons, 8-inch to United States Pipe & Foundry Co., Burlington, N. J., $41.90; to same foundry, 22 tons of 30 and 20-inch, lugged, $51.90; 385 tons valve box castings, to Alabama Pipe Co., Anniston, Ala.; 500 tons fittings, to a southern foundry.

2700 feet, Boston, 4-inch, by a Massachusetts public utility to Warren Foundry & Pipe Co., Phillipsburgh, N. J.

2250 tons, 8-inch, class 250 and 12-inch, class 350, Los Angeles. Allocated as follows: To National Cast Iron Pipe Co., 1290 tons 8-inch; to R. D. Wood & Co., Philadelphia, 960 tons 12-inch.

2100 tons, Lowell, Mass., assorted sizes, to Lowell Iron & Steel Co., Lowell, Mass.

2034 tons, up to 20-inch, Brentwood

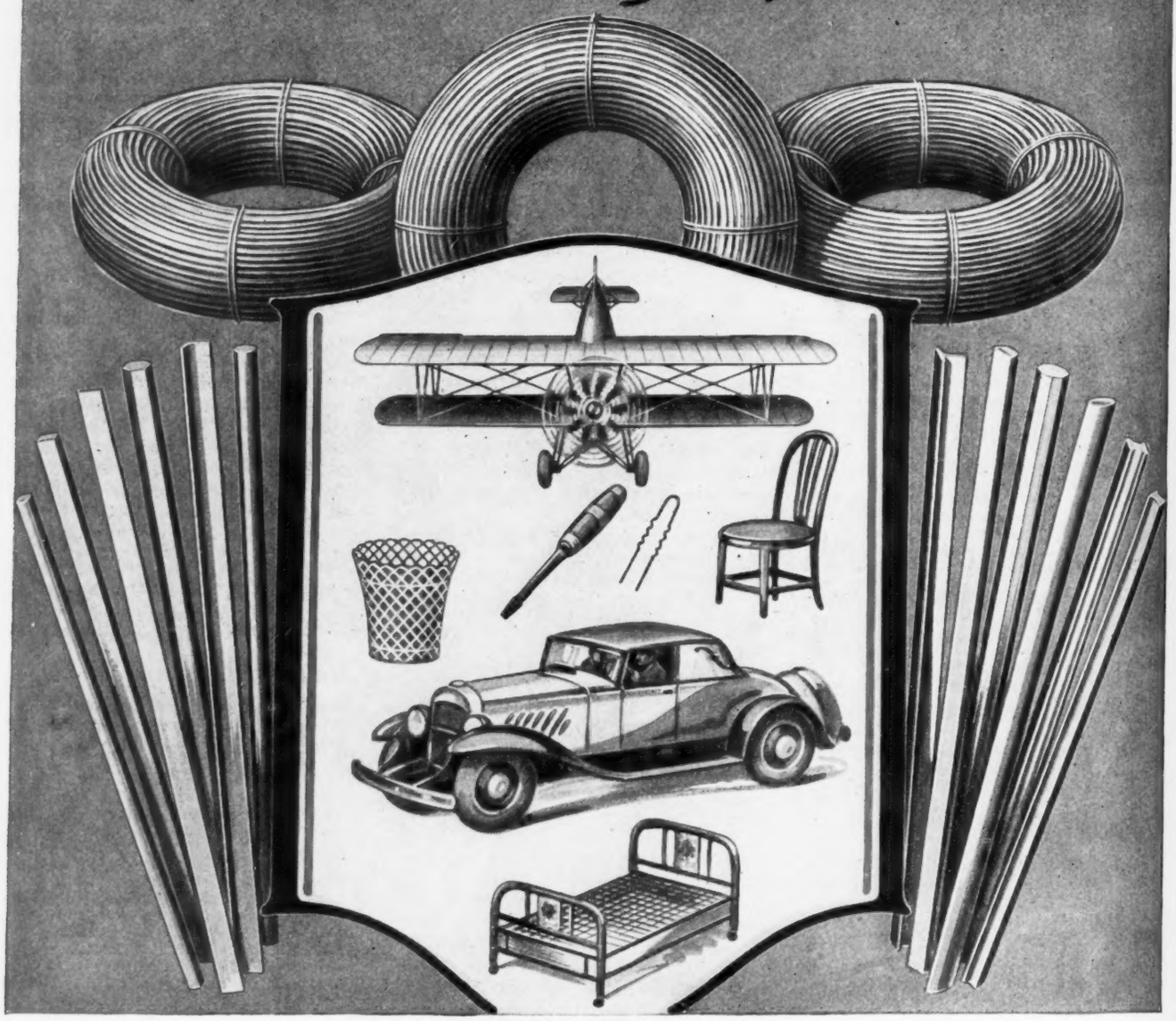
American QUALITY Steel & Wire Company

WIRE for Manufacturing

ONE HUNDRED YEARS of wire making experience is back of American Steel & Wire Company products—experience that will solve your most vexing problems quickly and efficiently.

When you require round, flat, square, octagon or other shapes of wire—communicate with us. Prompt delivery and complete engineering service are yours to command.

100 YEARS *of* QUALITY



1831 — COMMEMORATING AMERICAN STEEL & WIRE COMPANY 100 YEARS of PROGRESS IN WIRE MAKING — 1931

AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago — SUBSIDIARY OF UNITED STATES STEEL CORPORATION — And All Principal Cities

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Export Distributors: United States Steel Products Company, New York

hospital, Long Island, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J.; Brady Concrete Co., general contractor.

2000 tons, 30-inch cast pipe for Columbus, O., to James B. Clow & Sons, Chicago.

1882 tons, Pembroke, Mass., 6 to 10-inch, to French interests.

900 tons, 12-inch, Brooklyn, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J.; Dietz & Fallert Co., general contractor.

680 tons, 6 and 8-inch, Delavaud and class C, for Vancouver, B. C., to Evans, Coleman & Evans, Vancouver, representing Toronto manufacturer.

530 tons, 6 and 8-inch, class C, for Vancouver, B. C., to Pacific Water Works Supply Co., Seattle, representing French interests.

471 tons, 6 and 8-inch, class D, for Vancouver, B. C., to Gordon & Belyea, Vancouver, representing English manufacturer.

300 tons, Braintree, Mass., 6 and 8-inch, to Warren Foundry & Pipe Co., Phillipsburgh, N. J.

250 tons, 6, 8 and 12-inch, water main for Everett, Wash., to Agnew Hardware Co., Everett, Wash.

120 tons, Kenosha, Wis., to Lynchburg Foundry Co., Chicago.

100 tons, Gardner, Mass., 8-inch, to R. D. Wood & Co., Philadelphia.

100 tons, Weston, Mass., 10-inch, to United States Pipe & Foundry Co., Burlington, N. J.

Steel Pipe Awarded

35,000 tons, 12-inch, for Sinclair-Texas Pipe Line Co., from East Texas to Oklahoma City, Okla., reported awarded to Youngstown Sheet & Tube Co., Youngstown, O.

23,000 tons, 4-inch gas pipe for Chicago Natural Gas Line through Continental Construction Co., to A. O. Smith Corp., Milwaukee.

9000 tons, line pipe, for Trojan Engineering Co., to National Tube Co., Pittsburgh.

4250 tons, for Consolidated Gas Co., New York, to National Tube Co., Pittsburgh.

Contracts Pending

16,000 tons, 30, 36 and 48-inch cast pipe for Chicago; bids March 2.

3840 tons, 4 to 20-inch, 500 tons of fittings and 400 hydrants, yard stock, Queens, New York; bids March 6.

3000 tons, 42-inch, class B and C, for East Eightieth street, Seattle; Hans Peterson and H. G. Purcell, Seattle, low bidders.

2264 tons, 6 to 20-inch, class B, Long Beach, Calif., United States Pipe & Foundry Co., Burlington, N. J., low.

2200 tons, Brockton, Mass., various sizes.

1200 tons, 20-inch, for Queens, N. Y.; bids March 10, contractor's letting.

833 tons, 6-inch, class B, Los Angeles; bids opened.

765 tons, 4 and 6-inch, class C and D, for Burnaby, B. C.; bids in.

600 tons, 16-inch, for Brooklyn, N. Y.; bids March 10, contractor's letting.

200 tons, 8-inch, Beaumont, Tex.

150 tons, 2, 8 and 10-inch cast pipe for Stevens Point, Wis.; bids March 3.

140 tons, Medford, Mass., 6 and 8-inch; Warren Foundry & Pipe Co., Phillipsburgh, N. J., low.

Steel Pipe Pending

2200 tons, for New York Gas & Electric Co., inquiry to be placed soon.

Wire

Second Quarter Advance Forecast by Makers—Inquiry Little Improved—Jobbers More Active

WIRE PRICES, PAGE 83

Pittsburgh — Shipments of wire products during February were little changed from those of January but an increase in unfilled orders points to a better movement in March. Announcement on second quarter prices is expected shortly, with indications pointing to an advance over first quarter quotations. The market currently is $1.90 for wire nails to jobbers with plain wire 2.20c to 2.30c and wire rods $35.

Chicago — Merchant wire orders are improving. Western mills look to a fair fence wire business as fence work has been backing up for the last two years and some of this is expected to be brought to the surface. A check in steel electrical strand and cable wire is noted because of the instability of copper. Dealers are piecing out stocks but are cautious. Jobbers are more active. No price announcement is being made now for second quarter owing to the recent adjustment on annealed and other wire products. Little second quarter inquiry has appeared.

Worcester, Mass.—The market is beginning to react to a seasonal impulse which is expected to be felt until about the middle of April. Meanwhile orders have been showing a slight steady improvement. Prices, however, are holding at their former levels, current quotations on plain bright wire to dealers remaining at 2.40c, base, Worcester.

New York—Although no announcement has been made, some sellers have indicated intention of increasing 2.20c, Pittsburgh, on plain, bright wire. Such action may also extend to other wire products. Improved buying has strengthened trade sentiment. Nails, on the other hand, reflect little improvement in demand, with prices easy at $1.90, Pittsburgh, to jobbers and $2 to the general trade.

Cleveland—Wire sales the past week have been the best for six months with increased orders from manufacturers, bolt and nut makers, and some from country jobbing distributors. The latter prepare for the first of their two busy seasons of the year. Prices are firm at 2.20c, Pittsburgh and Cleveland base, for 6-9 gage plain wire, and the going market is $1.90 a keg on nails. Rods at $35 are again rumored to be raised for second-quarter, though as yet producers have not had interest from consumers that should normally be shown in that delivery at this time.

Bolt, Nut, Rivet Prices Are Being Extended

Bolts, Nuts, Rivets Prices, Page 83

Pittsburgh — Specifications for bolts, nuts, and rivets are steady with no improvement over demand of the past 30 days. Second quarter prices have not been announced but no change is expected from current quotations of 73 off for bolts and nuts and 2.75c, Pittsburgh, for large rivets.

New York—Contract for 400 tons of bolts and tie rods for the New Orleans municipal airport has been placed with Pittsburgh Screw & Bolt Corp., Pittsburgh. Aside from a tonnage for hangars for the war department, noted last week, little is pending. Leading bolt and nut makers have announced prices are unchanged for second quarter at 73 off the list and 2.75c, Pittsburgh, for rivets. Bids opened March 4 for 250 tons of ¾-inch bolts for East Boston traffic tunnel. A seller here has booked 210 tons of 2¼-inch rods.

Cleveland—Bolt and nut manufacturers have been pleased with orders, encouraged that commitments are coming equally from automotive, jobbing, and all other important consuming interests. Operations are much improved.

Chicago — Bolt, nut and rivet makers announce extension of existing prices through second quarter.

Tin Plate Demand Well Sustained; Output Higher

Tin Plate Prices, Page 83

Pittsburgh—Tin plate specifications are holding up well despite lack of further improvement. Mill operations are up slightly with the current average close to 75 per cent. Full schedules still are being maintained by some independent producers with the leading interest at slightly below the average for the industry. Tin plate continues $5, Pittsburgh, per base box.

New York—Approximately 500 tons of tin plate for casing has been placed for shipment to Japan.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago furnace	$17.50
Pittsburgh, dist. fur.	17.00
Pittsburgh, delivered	17.63 to 18.13
Valley furnace	16.50
Cleveland fur., local del.	17.50
Philadelphia, delivered	17.76
Virginia, furnace	17.75
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail, Brooklyn	19.91 to 20.91
Buff., all-rail Newark	18.28 to 18.78
Ala., Bir. fur., local del.	12.00 to 13.00
Alabama, del. Chicago	16.51 to 17.01
Alabama, del. St. Louis	14.92 to 15.42
Alabama, del. Cincinnati	14.19 to 14.69
Ala., Phila., dock del.	15.75 to 16.25
Ala., Balt., dock del.	15.50 to 16.00
Ala., Balt., dock del.	15.50 to 16.00
Alabama, New York dock	16.00 to 16.50
Ala., Boston dock del.	16.25 to 16.75
Tenn., Bir. base, local del	13.00
Tennessee, del. Cinn.	14.19 to 14.69
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	18.00
Buff., all-rail, Brooklyn	20.91 to 21.41
Buffalo, all-rail Newark	18.78 to 19.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	18.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	19.00
Eastern, del. Phila.	18.76 to 19.26

MALLEABLE

Valley furnace	17.00
Cleveland fur., local del.	17.50
Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Chicago, furnace	17.50
Buffalo fur., local del.	18.00
Eastern Penna., delivered	18.26 to 20.91
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	17.00
Pittsburgh, delivered	17.63 to 18.13
Eastern Penn., del.	17.25 to 17.75
Buffalo fur., local del.	17.00
Montreal, delivered	20.50
Valley, furnace	16.50

BESSEMER

Valley furnace	17.00
Pittsburgh, delivered	18.13 to 18.63
Pittsburgh, furnace	17.50

LOW PHOS.

Valley fur., standard	27.00
Philadelphia, standard	24.76 to 27.79
Copper-bear., E. Pa. fur.	22.50 to 23.00

GRAY FORGE

Valley furnace	16.00
Pittsburgh district fur.	16.50
Pittsburgh, delivered	17.13 to 17.63

CHARCOAL

Lake Superior, del. Chi.	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$26; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.50
Connellsville foundry	3.25 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell., basis	5.50
Buffalo, ovens	8.00 to 8.50
Detroit, ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports	
Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.00
North African low phosphorus	9.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish, North African basic, 50 to 60%	9.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$11.25 to 12.50
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 to 28 cents
South African, 52%	26 to 28 cents
South African, 49-51%	25 to 26 cents
South African, 44-47%	24 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	23 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

PRICES PER GROSS TON

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$30.00
Pittsburgh, bessemer	30.00
Youngstown	30.00
Cleveland	30.00
Philadelphia	35.30 to 36.30
Chicago	31.00
Forging, Chicago	36.00
Forging, Pittsburgh	36.00
Forging, Philadelphia	40.30 to 41.30

SHEET BARS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00
Chicago	31.00

SLABS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.79
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 160.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one-ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

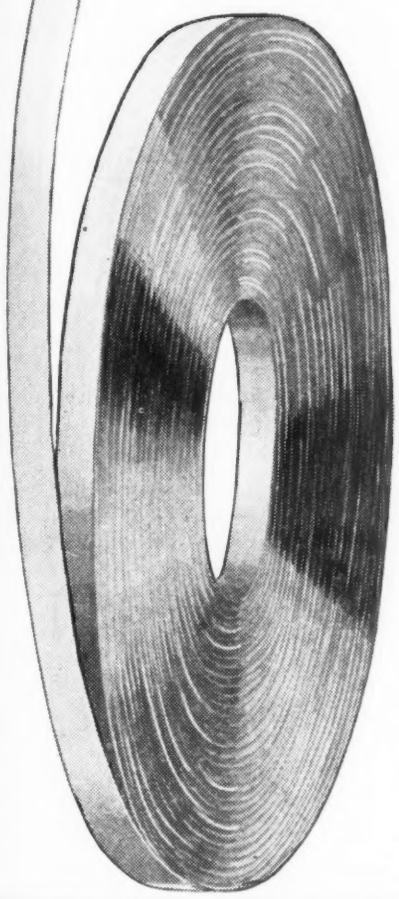
85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$14.00
Washed gravel, import duty paid east, tide, gross ton	19.00 to 19.50

SAVE WITH STEEL

Sharon Strips

HOT AND COLD ROLLED



"ACCURACY"

The word "ACCURACY" in relation to gauge gains added significance when applied to "SHARON" STRIP STEEL.

Tolerances in this case are held as close as humanly possible — a characteristic which is highly desirable to every consumer of strip steel because it insures ease in stamping and thus promotes economy.

EXTRA DEEP DRAWING STRIPS ARE OUR SPECIALTY

SHARON STEEL HOOP COMPANY

GENERAL OFFICE
SHARON, PENNSYLVANIA

Sales Offices

CHICAGO
ST. LOUIS
CINCINNATI
CLEVELAND
NEW YORK
DETROIT

WORKS
SHARON, PA. YOUNGSTOWN, O. LOWELLVILLE, O.

Sales Offices

PHILADELPHIA
SAN FRANCISCO
NEW ORLEANS
SHARON
TORONTO
MONTREAL

Pig Iron

More Inquiry Develops for Second Quarter—Shipments Continue To Show Improvement

PIG IRON PRICES, PAGE 94

Pittsburgh—The pig iron market lacks improvement in shipments or new business. Foundry operations generally are holding at the rate of the past several weeks, iron foundries continuing around 40 per cent. Basic iron requirements by nonintegrated steelmakers are light, with little new buying in prospect. Current orders are small. Prices are unchanged, with new business usually on the basis of $16.50, valley, for No. 2 foundry, and $17 for bessemer and malleable.

Boston—Sales in this district increased to 3200 tons in the past week, Mystic Iron Works, Everett, Mass., booking 2700 tons. Competition from southern and Buffalo furnaces is keen and prices are easy.

New York—Pig iron sales increased to 10,000 tons in this district in the past week. The Crane Co., Bridgeport, Conn., placed about 1000 tons of foundry iron and is inquiring for 500 tons of low phosphorus. Some pending inquiries call for shipment into third quarter. In all about 5000 tons is on inquiry. Prices are unchanged .

Philadelphia—Inquiry is featured by one for 2500 tons of basic for the General Steel Casting Co., Eddystone, Pa. Current orders are small and prices are unchanged.

Youngstown, O.—Offers of substantial orders for foundry pig iron have been made to local blast furnace interests at $16.50, valley, but they have been refused. So far no producer in this district now is quoting $16.50 and the general market here for No. 2 foundry and basic is $17, while bessemer and malleable are $17.50. This firmer attitude follows a little flurry in pig iron a week ago.

Cleveland—Current orders are restricted mainly to small lots to round out first quarter requirements. The week's sales booked by furnace interests with headquarters in Cleveland totaled 10,600 tons, about 2000 tons more than in the week preceding. With the approach of the second quarter inquiry is more active. The February daily rate of shipments was on a par with that of January for one Cleveland maker, while two lake furnace companies whose output goes largely to the automotive industry report increases up to 10 per cent. Lake furnace prices for shipment outside of Cleveland, Toledo and Detroit, are steady at $16 to $17, while the market in Cleveland is $17.50, base, furnace.

Cincinnati—Shipments of pig iron on contracts is without marked change, although sales during the past week declined. An Indiana melter is in the market for 2000 to 3000 tons of malleable. The furnace of the Hamilton Coke & Iron Co. again is in blast, with part of the output sent as hot metal to sheet mills in Middletown, O.

St. Louis—Prices are firmer as a result of continued, but moderate, improvement in sales and shipments. A southern producer and the leading local furnace interest here are contemplating an increase of 50 cents. The February daily rate of shipments exceeded that of January, and indications point to March improving on the February rate.

Birmingham, Ala.—Sales still are restricted to small lots. Books have not been opened for second quarter. The usual price for delivery in this district is $13, base, furnace. Two stacks are being relined.

Toronto, Ont.—Buying is well sustained at the recent improved rate, and inquiries are beginning to appear for second quarter. Sellers expect an increased volume of business for that period.

Chicago—More second quarter inquiry from buyers usually placing 1000 to 2500 tons is noted. A south Chicago steelworks now is more actively in the merchant trade through middle interests and by direct sales. The price continues $17.50, base, furnace. Several orders for silvery iron have been closed and two inquiries are pending. Southern iron shipments are good but contracting is light. Shipments of northern iron in February gained over the January rate.

Ferroalloy Specifications Are More Liberal

Ferroalloy Prices, Page 94

New York—Although spot demand is lacking, contract specifications for spiegeleisen are better. Domestic material, 19 to 21 per cent, is steady at $30, furnace, in car lots. Foreign spiegeleisen, 26 to 28 per cent, is unsettled. No substantial sales have been noted since the recent purchase of several hundred tons by a wheel manufacturer. Contract specifications on ferromanganese also are a little larger, with the market $85, duty paid, for carloads.

Shipments of special ferroalloys continue at moderately good rates, holding the gains made early in the year. Practically all consumers are covered on contracts, and prices are unchanged. A little business has been done in spot tungsten ore but this market remains indefinite.

Pittsburgh—Shipments of ferromanganese and spiegeleisen continue around the quiet rate of the past several weeks but are slightly heavier than a month ago. Activity in the spot market remains light, with prices continuing $89.79, delivered, for ferromanganese and $30, furnace, for spiegeleisen, both prices applying on small lots. Prices on other ferroalloys are unchanged. Demand is slightly better since the first of the year.

Chicago—Specifications from automotive foundries and steelworks are gaining. Shipments of ferrochrome from gray iron foundries have picked up.

Manganese Ore Active

New York—Manganese ore specifications reflect the slight increase in steelmaking operations. Little spot business is noted. Both the prime grades of Caucasian and South African ores are 26c to 28c per unit in carload lots, not including duty. The foreign ore situation is quiet.

Iron Ore Inquiry Opens with Ford's 290,000 Tons

Iron Ore Prices, Page 94

Cleveland—The Ford Motor Co. has issued an inqury for 290,000 tons of iron ore for 1931. This is a reduction of about 40,000 tons from its inquiry last year, the difference probably to be made up by the increasing production from the Ford mines. A third of the current inquiry is for basic, one-third for manganiferous and the remainder for silicious and high phosphorus ores. No definite date has been set for closing, and it is unlikely that action will be taken this month. The impression prevails in the industry that ore prices this year will not be changed from those of last year. The Ford inquiry is the only one pending.

Hoist Body Meets March 19

New York—Annual meeting of Electric Hoist Manufacturers' association will be held here March 19. J. G. Worker, American Engineering Co., Philadelphia is chairman of the association.

Scrap

Dull Conditions Continue as Consumption Fails to Increase —Prices Show Weakness

Chicago—While dealers strongly resist further recessions in steel scrap prices, the market has rather a sidewise movement than any strengthening feature. About 3000 tons of heavy melting steel of secondary specifications has been taken by a melter, but selling interests still quote $9.75 to $10.25, the bottom of the spread representing dealer buying prices. Negotiations for forward tonnage are at a standstill. This condition results in nominal prices for virtually all grades. While improved steelworks operations in the Chicago district are encouraging, immediate gains in scrap consumption are discounted by large reserves. More distress scrap is on tracks, due to favorable shipping conditions and a number of rejections. Large users have been less rigid in

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	9.50 to 11.00
Boston, dealers	6.75 to 7.00
Buffalo, No. 1	11.00 to 11.50
Buffalo, No. 2	9.50 to 9.75
Chicago	9.75 to 10.25
Cinci., deal.	9.50 to 10.00
Cleve., No. 1	10.00 to 10.50
Cleve., No. 2	9.75 to 10.00
Det., No. 1 deal.	9.50 to 9.75
Det., No. 2 deal.	7.00 to 7.50
E. Pa. del. mill	10.00 to 11.00
N. Y. del. R. R.	7.00
N. Y. deal. No. 2	5.50
N. Y., deal. yd.	5.00
Pitts., No. 1	12.50 to 13.00
St L. No. 1 sel	10.50 to 11.00
Federal, Ill.	9.00 to 9.50
Granite C., Ill.	8.75 to 9.25
Valleys, No. 1	12.00 to 12.50

COMPRESSED SHEETS

Buffalo, dealers	9.50 to 9.75
Chicago	8.50 to 9.00
Cleveland	9.00 to 9.25
Detroit, dealers	9.00 to 9.50
E. Pa. new mat.	9.00 to 10.00
Pittsburgh	12.75 to 13.25
Valleys	12.00

BUNDLED SHEETS

Buffalo	7.00 to 7.50
Cinci., deal.	8.75 to 9.25
Cleveland	7.00 to 7.25
Eastern Pa.	9.00
Pittsburgh	11.50 to 12.00
St. Louis	5.50 to 6.00

SHEET CLIPPINGS LOOSE

Chicago	5.00 to 5.50
Cincinnati	5.00 to 5.50
Detroit, dealers	6.00 to 6.50
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	12.00 to 12.50
Boston, dealers	5.50 to 7.00
Buffalo	13.75 to 14.25
Chicago (3 ft.)	11.00 to 11.50
Chicago (2 ft.)	12.00 to 12.50
Cinci., deal.	14.25 to 14.75
Detroit, deal.	12.50 to 13.00
Pitts. (open-hearth, 3 ft. and less)	14.50 to 15.00
St. Louis	13.00 to 13.50

STOVE PLATE

Birmingham	8.00 to 8.50
Boston, con.	8.00 to 8.50
Buffalo	9.50 to 10.00
Chicago, net	7.75 to 8.25
Cinci., deal. net	5.25 to 5.75
Det., net, deal.	6.25 to 6.75
Eastern Pa.	9.00 to 9.50
N. Y., deal. mill	4.75
St. Louis	8.00 to 8.50

COUPLERS, SPRING

Buffalo	13.50 to 14.00
Chicago	12.00 to 12.50
Eastern Pa.	16.50
Pittsburgh	16.00 to 16.50
St. Louis	11.00 to 11.50

ANGLE BARS—STEEL

Chicago	11.00 to 11.50
St. Louis	9.50 to 10.00

LOW PHOSPHORUS

Buff., billets and bloom crops	15.00 to 15.50
Cleveland bil. and bloom crops	16.50 to 17.00
Eastern Pa.	17.00
Pittsburgh billet bloom crops	17.50 to 18.50
Pitts. sheet bar crops	16.50 to 17.00

FROGS, SWITCHES

Chicago	10.50 to 11.00
St. Louis	10.00 to 10.50

SHOVELING STEEL

Chicago	9.75 to 10.25
Cleveland	6.50 to 7.00
St. Louis	9.25 to 9.75

RAILROAD WROUGHT

Birmingham	9.00 to 10.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	8.50 to 9.00
Buffalo, No. 2	10.75 to 11.25
Chicago, No. 1	9.00 to 9.50
Chicago, No. 2	9.75 to 10.25
Cinci., No. 2	9.50 to 10.00
Eastern Pa.	11.00
N. Y., No. 1 deal.	10.00 to 10.50
Pitts., No. 2	12.50 to 13.00
St. Louis, No. 1	7.50 to 8.00
St. Louis, No. 2	9.25 to 9.75

SPECIFICATION PIPE

Boston	6.50 to 7.00
Eastern Pa.	11.50 to 12.00
N. Y., deal.	7.25 to 7.50

BUSHELING

Buffalo, No. 1	9.50 to 9.75
Chicago, No. 1	8.00 to 8.50
Cinn., No. 1 dl.	8.00 to 8.50
Cinn., No. 2	4.50 to 5.00
Cleve., No. 2	6.50 to 7.00
Det., No. 1 new deal.	8.00 to 8.50
St. L., No. 1	6.50 to 7.00
Val. new No. 1	11.00 to 11.50

MACHINE TURNINGS

Birmingham	7.00 to 7.50
Boston, dealers	2.00 to 2.50
Buffalo	6.00 to 6.50
Chicago	4.25 to 4.75
Cinn., deal.	4.50 to 5.00
Cleveland	4.75 to 5.25
Detroit	4.25 to 4.75
Eastern Pa.	7.00 to 7.50
N. Y., deal.	3.00
Pittsburgh	7.75 to 8.00
St. Louis	4.00 to 4.50
Valleys	8.50 to 8.75

BORINGS AND TURNINGS For Blast Furnace Use

Boston	2.00 to 2.60
Buffalo	6.75 to 7.25
Cinn., deal.	4.50 to 5.00
Cleveland	7.00 to 7.25
Detroit, deal.	5.00 to 5.50
Eastern Pa.	6.00 to 7.00
N. Y., deal.	3.00
Pittsburgh	7.50 to 8.00

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	7.00 to 7.50
Boston, chem.	9.10 to 9.60
Boston, deal.	2.00 to 2.50
Buffalo	6.75 to 7.25
Chicago	4.50 to 5.00
Cinn., deal	4.50 to 5.00
Cleveland	7.00 to 7.25
Detroit, deal.	5.00 to 5.50
Eastern Pa.	7.00 to 7.50
E. Pa., chem.	13.50 to 14.50
N. Y., deal.	3.50
Pittsburgh	7.50 to 8.00
St. Louis	6.00 to 6.50

PIPE AND FLUES

Cinn., deal.	7.50 to 8.00

RAILROAD GRATE BARS

Buffalo	7.25 to 7.75
Chicago, net	7.00 to 7.50
Cincinnati	7.00 to 7.50
Eastern Pa.	9.00 to 9.50
N. Y., deal.	6.00
St. Louis	7.50 to 8.00

FORGE FLASHINGS

Boston, deal.	5.50 to 6.10
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	8.00 to 8.50
Detroit	7.75 to 8.25

FORGE SCRAP

Boston, del.	5.10 to 5.60
Chicago	13.50 to 14.00
Eastern Pa.	10.50 to 11.00

ARCH BARS, TRANSOMS

Chicago, net	10.50 to 11.00
St. Louis	11.50 to 12.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	10.50 to 11.00
Chi., steelworks	7.50 to 8.00
Cleveland	8.00 to 8.50
Eastern Pa.	11.00
Pittsburgh	11.50 to 12.00
St. Louis	7.50 to 8.00

STEEL CAR AXLES

Birmingham	14.00 to 14.50
Boston, ship. pt.	14.00 to 15.00
Buffalo	15.50 to 16.00
Chicago	14.00 to 14.55
Eastern Pa.	18.50 to 19.50
St. Louis	14.50 to 15.00

SHAFTING

Bos., ship. pt.	13.00 to 13.50
Chicago	12.90 to 13.45
N. Y., deal.	13.00 to 14.00
St. Louis	12.00 to 12.50
E. Penna.	18.00

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	13.50 to 14.00
Chicago, iron	10.75 to 11.25
Chi., roll steel	13.50 to 14.00
Cincinnati, iron	10.50 to 11.00
E. Pa. steel	15.50 to 16.00
E. Pa. iron	13.50 to 14.00
Pitts., iron	13.50 to 14.00
Pitts., steel	16.00 to 16.50
St. Louis, iron	10.00 to 10.50
St. Louis, steel	13.00 to 13.50

NO. 1 CAST SCRAP

Birming., cup.	9.50 to 10.00
Buffalo (mach.)	10.50 to 10.75
Boston, textile	9.00 to 9.50
Chicago, mach.	10.65 to 11.20
Chi., railroad	10.10 to 10.65
Chicago, agri.	9.50 to 10.10
Cinn., mach. cup, gross	13.00 to 13.50
Cleve. cupola	12.00 to 12.50
Det., net deal.	8.50 to 9.00
E. Pa. cupola	13.00
N. Y. cup. deal.	8.00 to 8.50
N. Y., del. local foundries	12.00
Pitts., cupola	12.50 to 13.00
San Fran., del.	13.50 to 14.00
Seattle	8.50 to 9.00
St. L. No. 1 ma.	9.75 to 10.25
St. L. No. 1	9.00 to 9.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast.	11.50 to 12.50
Buffalo, break.	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto, net deal.	10.50 to 11.00
Det., break., dl.	6.50 to 7.00
Eastern Pa.	11.00
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	7.00 to 7.50
Pittsburgh	9.50 to 10.00

MALLEABLE

Boston R. R.	13.00 to 13.50
Buffalo	12.00 to 12.50
Chicago, agri.	10.50 to 11.00
Chicago, R. R.	12.00 to 12.50
Cinn., R. R. dl.	11.50 to 12.00
Cinn., agri., dl.	12.00 to 12.50
Cleve., rail	12.00 to 12.50
Det. auto deal.	11.00 to 11.50
St. Louis, rail	10.50 to 11.00

RAILS FOR ROLLING 5 feet and over

Birmingham	11.25 to 11.50
Boston	8.50 to 9.00
Buffalo	10.25 to 10.75
Chicago	12.00 to 12.50
Eastern Pa.	13.00 to 13.50
New York	9.00 to 9.50
St. Louis	10.75 to 11.25

LOCOMOTIVE TIRES

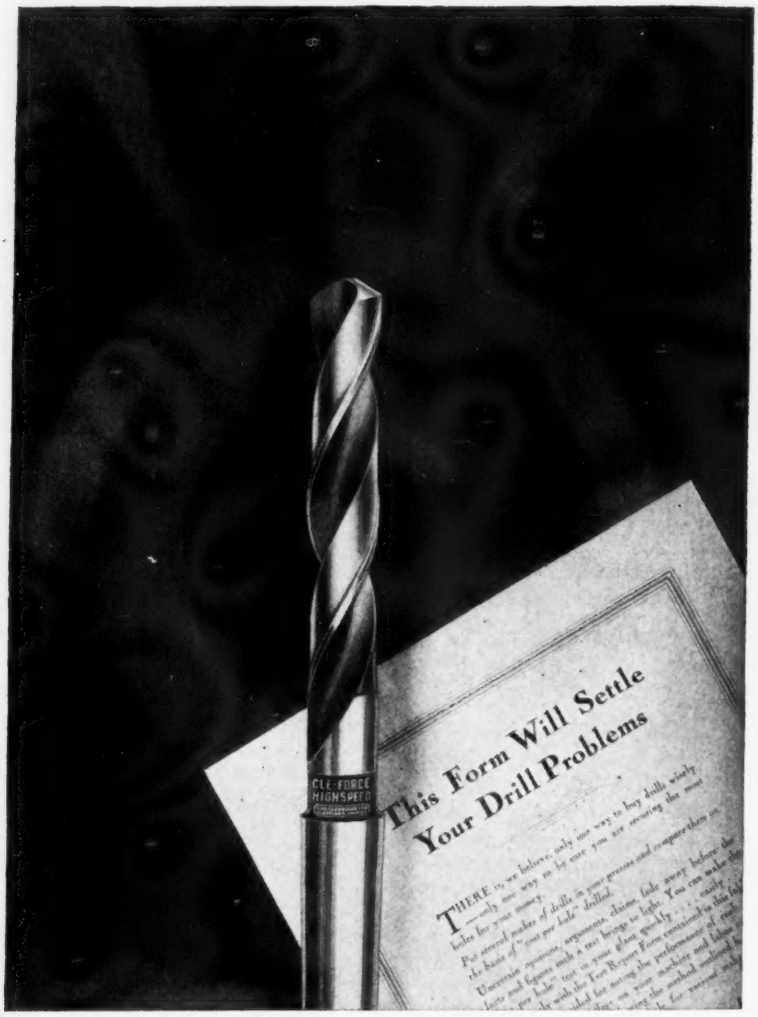
Chicago, cut	13.00 to 13.50
St. L. No. 1	11.00 to 11.50

LOW PHOS. PUNCHINGS

Chicago	11.25 to 11.75
Buffalo	14.00 to 14.50
Eastern Pa.	15.50 to 16.50
Pittsburgh	15.50 to 16.00

A drill in itself is of no value to you. You buy it for the number of holes it will produce. The sure way to save money on drills, therefore, is to compare their price in terms of "cost-per-hole" drilled on your own jobs. A quick method of making this comparison was devised for us by a well known firm of investigating engineers. It is simple, accurate and final. Users say it is a valuable contribution to scientific purchasing. Savings in drill cost reported, vary from $127 to $1167 yearly. The necessary forms and a description of the method will be mailed to you without obligation. Use the coupon below.

You buy drills —but you pay for HOLES



THE CLEVELAND TWIST DRILL CO.
1242 E. 49th St., Cleveland, Ohio

Kindly send me "Cost-per-Hole" Drill Test Forms and instructions. I am not to be obligated in any way.

Name _____

Company Name _____

Address _____

The CLEVELAND TWIST DRILL COMPANY
1242 EAST 49th STREET
CLEVELAND

TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES

30 READE ST. NEW YORK 9 NORTH JEFFERSON ST. CHICAGO 654 HOWARD ST. SAN FRANCISCO
LONDON - 35-36-37 UPPER THAMES ST., E.C.4

Copyright 1931 by The Cleveland Twist Drill Co.

limiting restrictions. Foundries are unable to schedule business ahead more than a day or two.

Boston—A better situation is developing in steel and iron scrap. One broker has found better demand and has sold some tonnage. While the market generally has displayed little change, some dealers are of the opinion that materials could be sold if sellers would accept prevailing prices, but this they are reluctant to do. The Boston & Albany railroad has issued a miscellaneous list.

New York—Dealers' buying prices are unchanged. Heavy melting scrap is $10.50, delivered eastern Pennsylvania, with little shading reported. Demand is slightly more active, but consumers are buying close to actual needs. Yard stocks are not heavy. There appears to be little distress

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

material. An eastern Pennsylvania mill has taken close to 7000 tons of beams from a New York wrecking job at $9, f.o.b. This material is supposed to have been contracted for on a per ton basis several months ago and represents an advance over current quotations.

Philadelphia — Prices of steel and iron scrap are unchanged but lack the test of demand. Trading is light. Most consumers are well covered for the present rate of operation and scrap producers see little likelihood of demand increasing soon.

Cleveland—One large scrap consumer continues to take moderate shipments of blast furnace borings and turnings. No announcement has been made concerning lifting the embargo on heavy melting steel, previously proposed for March 15. Demand for foundry grades continues light. Quotations on most grades remain nominal and unchanged. Steelmaking scrap continues to move in fair volume to Warren. Shipments to Youngstown mills, however, are restricted. Valley quotations also are unchanged.

Buffalo — Recent purchase by Bethlehem Steel Co. of hydraulic sheets at $8 covered a tonnage of automobile sheet scrap with some miscellaneous sheet scrap, both new and old. This is not the equal of hydraulic bundles of new sheet scrap, which is worth $2 per ton more. The market on the latter grade continues $10.

Pittsburgh—Listlessness marks the steel and iron scrap market and mills are not interested in buying. Better buying is looked for during March. Prices are steady and gain strength slowly. Heavy melting steel continues at $13.25 on recent small sales and other grades are unchanged.

Detroit—Production of steel and iron scrap at auto plants has been increased in February as monthly lists have exhibited. In several cases, notably from two well-known body plants, production has been increased 50 per cent. There is an easier tendency in cast iron borings, mixed borings and short turnings, new No. 1 busheling, compressed sheets and short shoveling turnings.

Cincinnati — Shipments of iron and steel scrap on orders are somewhat improved, although new business remains dull. Best grades of heavy melting steel are firm. Quotations on other items are nominally unchanged.

St. Louis—The trend of steel and iron scrap prices continues downward, though less sharply than in recent weeks. Recent weakness has been due to heavy offerings and prompt deliveries by railroads. Heavy melting steel declined another fraction, to a minimum of $9, a new low. Cast borings and No. 1 busheling were also lowered fractionally, but otherwise there were no revisions in prices.

Birmingham, Ala.—Demand lags and prices are unchanged and weak. Heavy melting steel holds to $11 for the better grade, and with some demand for stove plate is attracting most attention.

Toronto, Ont.—While no special developments have appeared in the iron and steel scrap markets sales volume was well sustained. The principal demand is for iron grades and some good orders for machinery cast have been closed. Steel grades are moving slowly with mills holding purchases to small lots of special grades. Prices are unchanged.

Eastern Steel Down Month

Philadelphia—Operations of the Eastern Steel Co., Pottsville, Pa., were suspended March 1 for a month by order of the receivers and with the approval of the court, pending reorganization.

Coke

Market Continues Quiet, and Prices Are Unchanged—Foundries Taking Fuel at Steady Rate

COKE PRICES, PAGE 94

Pittsburgh—Beehive coke demand is quiet. Furnace fuel is moving slowly. The standard furnace grade continues $2.50, with material of higher sulphur content bringing less. Foundry coke shipments are steady, but shipments lack improvement. Demand for heating coke is quieter.

Boston — Contract supplies are more than sufficient to meet foundries' requirements. Shipments are being deferred in some instances. The spot market is quiet.

New York—Little gain is noted in demand for metallurgical coke, foundries in this district operating around 45 per cent. Aside from an occasional distress offering, beehive furnace coke is moving at $2.50, Connellsville, Pa. Beehive foundry coke is $3.50 to $3.75 for standard grades, and $4.70 to $4.75, Latrobe, Pa., for premium brands. By-product coke is $9 to $9.40, Newark, N. J.; $11, New England; and $9, Philadelphia.

Cincinnati—New business in by-product foundry coke is scarce. One important interest reported shipments of domestic grades during February exceeded those for the same month of 1930.

St. Louis — By-product foundry coke shipments in this district in February exceeded those in either December or January. Specifications show March will be still better. The melt is increasing and some users show a tendency to build stocks.

Birmingham, Ala. — Coke consumption in this district is slightly larger than at the beginning of the year. Production is unchanged. Prices are steady.

Pacific Coast

Little Change in Demand for Most Commodities—Total Sales in Some Lines Close to 1930—Public Works Provide Most Tonnage in Northwest—Vancouver Divides Pipe Tonnage

Seattle—Demand for iron and steel products in the Pacific Northwest is confined almost entirely to public works. Industrial and construction activity is lagging although the market as a whole is in a more hopeful frame of mind. Awards this week exceeded 2000 tons of pipe and steel but no projects of importance have recently developed.

Bars, Plates and Shapes

Merchant and concrete bars, while mill prices are unchanged at 2.25c and 2.30c respectively, are moving only in small tonnages, the total volume being considerably below normal. This is due largely to lack of building construction. Tonnages pending are small and no projects of importance are in sight. Awards placed since the first of the year are considerably less than a year ago. Three bridge jobs, involving a total of about 300 tons of reinforcing steel have been placed. Fred and Harold Lockyear, Portland, Oreg., have the contract for a state bridge, 167 feet long, near Waitsburg, Wash. Gabbey & McNeill, Boise, Idaho, will build a 113-foot bridge across Fall river on the Yellowstone park highway. Tom Lillebo, Reedsport, Oreg., has the contract for a 235-foot concrete bridge over the Tahkenitch river, Douglas county, Oreg.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Seattle has received bids for 5594 feet of $\frac{5}{16}$-inch 24 and 36-inch riveted or lockbar steel water pipe for First avenue south, involving about 350 tons. Award will likely be made within a week. Mill prices of plates range from 2.10c up but no specifications testing the market have recently been up.

Washington Iron Works, Seattle, has the contract for a special bulk material crane, requiring 100 tons of structurals and castings, for the Pioneer Sand & Gravel Co., Seattle. Bids have been opened for a federal roads bridge in Mt. Baker, Wash., district, 125 tons. Union Bridge Co., Portland, was low at $20,638 for a steel bridge over Rock Creek, Cowlitz county, Wash. Mill prices of shapes are unchanged at 2.25c.

Wholesale jobbers report business slow but improved over January. Bars and shapes are moving in fair volume but plates are unusually dull while buyers show little interest in sheets. Prices of sheets, out of stock in tonnages of 40,000 pounds or more, were reduced today as follows: Galvanized and black 30.00c per cwt; blue 20.00c per cwt. f.o.b. warehouse. This applies only to Seattle territory. These changes were approved to place sheets in line.

Vancouver Pipe Is Divided

Award is pending for 3000 tons of 42-inch cast pipe for a water extension project on East Eightieth street, Seattle. The job involves $175,000. Hans Peterson, Seattle, is low bidder and the pipe contract is expected to be awarded. H. G. Purcell, Seattle, representing the United States Pipe & Foundry Co., Vancouver, B. C., has awarded 75,000 feet of cast iron pipe to representatives of Canadian, English and French manufacturers, as follows: Evans, Coleman & Evans, Vancouver, B. C., representing a Toronto firm, 280 tons of 8-inch Delavaud; 270 tons 6-inch and 130 tons, 8-inch; Gordon & Belyea, Vancouver, B. C., representing English manufacturers, 279 tons 8-inch and 192 tons, 6-inch; Pacific Waterworks Supply Co., Seattle, representing French interests, 270 tons 6-inch and 260 tons 8-inch. The total is 1681 tons. The price totals $71,473. Burnaby, B. C., opened bids this week on 765 tons of 4 and 6-inch. Cast iron interests lost out on 400 tons at Bellingham, Wash., which went wood stave, and 250 tons at Everett which went steel pipe, awarded to Agnew Hardware Co., Everett. Portland has awarded 56 tons of castings for the water bureau to Phoenix Iron Works, Portland.

Rail, Pipe Awards Lead

San Francisco—(*By Air Mail*)—Movement of steel products on the Pacific Coast has shown some improvement but most business consisted of relatively small lots. Prices have shown no further signs of weakness and the tendency now appears upward.

Of special importance this week was the award of 10,350 tons of 110-pound tee rail for the Western Pacific railroad, San Francisco, to the Colorado Fuel & Iron Co. and 2250 tons of cast iron pipe for Los Angeles to two eastern makers.

Bars, Plates and Shapes

Concrete bar awards aggregated 893 tons and brought the total for the year to 9910 tons, compared with 7327 tons for the corresponding period in 1930. A post office in Pomona, Calif., calling for 100 tons and a paving project in San Joaquin County, Calif., requiring 240 tons, were placed with unnamed interests. Pending business exceeds 7000 tons. The largest new inquiry is for 4000 tons for the Sixth street bridge in Los Angeles. No change in jobbers' prices are noted, 2.50c, base, on carload lots both in the San Francisco and Los Angeles districts, being firm.

Demand for plates is considerably below that of last year. No awards of importance were placed during the week. The East Bay municipal utility district, Oakland, Calif., will open bids March 11 for 210 tons for a 20-inch welded pipe line in which ¼-inch plate will be used. Prices are being fairly well maintained, despite the lack of demand, and 2.05c, to 2.15c, c.i.f., is general.

Structural shape awards aggregated 1238 tons and brought the total for the year to 16,938 tons, compared with 17,841 tons for the corresponding period in 1930. The Minneapolis Moline Power & Implement Co., Minneapolis, took 100 tons for a post office at Pomona, Calif. San Francisco will open bids on March 25 for 300 tons for a bridge over Islais creek. Bids were opened on 250 tons for a science building in Golden Gate park, San Francisco, Dyer Bros. being low bidders. Quotations range from 2.15c to 2.25c, c.i.f.

Other Finished Material

Cast iron pipe awards totaled 2546 tons, bringing the aggregate to date this year to 12,198 tons, compared with 15,841 tons for the same period a year ago. The National Cast Iron Pipe Co. and R. D. Wood & Co. booked 1290 tons and 960 tons, respectively, for Los Angeles. That city also opened bids on 833 tons of 6-inch pipe. The United States Pipe & Foundry Co. is low bidder on 2264 tons of 6 to 20-inch pipe for Long Beach, Calif. Demand for steel pipe continues light, stocks in distributors' warehouses being well rounded.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

	Steel		Iron		
In	Blk.	Gal.	In.	Blk	Gal.
⅛	58	44½	½	23	5
¾	62	50½	¾	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, Lap Welded Steel		f.o.b. Pittsburgh Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill

Random lengths over 5 ft. 55%
Selected lengths, 1 to 18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.....$37.00 to 38.00
Four-inch, Birmingham..... 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago..... 45.20 to 46.20
Six-inch and over, N. Y..... 37.50 to 39.50
Four-inch, New York..... 40.50 to 41.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia	2.60c
Pittsburgh	2.75c
Portland	3.15c
San Frans.	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York‡(d)	3.10c
Philadelphia	2.60c
St. Louis	3.15c
Tulsa	3.65c

REINFORC. BARS

Baltimore	2.50c-3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga	3.10c
Cincinnati	3.15c
Cleveland	2.25c-2.44c
Detroit	3.00c
Houston	3.00c
Los Ang. cl.	2.40c
Los Ang. lcl.	2.70c
New York	2.65c-3.10c
Phila.	2.40c-3.00c
Pittsburgh	2.75c
San Fran. cl.	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia	2.50c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York(d)	3.30c
Philadelphia	2.50c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	2.75c

NO. 10 BLUE

Baltimore	3.50c
Boston	3.915c
Buffalo	3.50c
Chattanooga	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
N. Y. (d)	3.00c-3.40c
Portland	4.00c
Phila.*†	3.05c
Pitts.**	3.10c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Clev.***	3.75c
Detroit	3.75c
Los Ang.	4.70c
New York	3.50c-3.65c
Phila.*†	3.60c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.35c
Seattle	4.50c
St. Louis	4.05c
St. Paul	3.545c
Tulsa	4.10c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	5.45c
Buffalo	4.40c-4.60c
Chicago (local del.)	4.35c
Chicago (outside)	4.35c-4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.25c
Houston	5.40c
Los Ang.	5.10c
New York	4.00c-4.10c
Phila.*†	4.15c
Pitts.**	4.00c
Portland	5.00c
San Fran.	5.00c
Seattle	5.00c
St. Louis	4.60c
St. Paul	4.23c
Tulsa	4.60c-4.75c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.50c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia	2.90c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia	3.15c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.75c

COLD FIN. STEEL
Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.40c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 5c extra, except Tulsa, where 5.14c is quoted.
(a) Rounds, hex. only.

COLD ROLL. STRIP

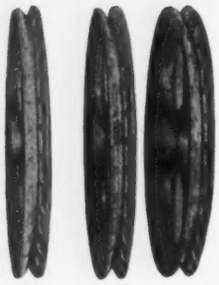
Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
Phila. (c)	4.85c
New York	5.05c

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
‡Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

FARRELL'S EIGHTY FIVE -85

TOUGH-RIGID-STRONG-WEAR RESISTING CAST STEEL

TRADE MARK



CHAIN HOIST WHEELS

PUMP CASTINGS

TRAWLER SHEAVES

CLEVISES

TRAMWAY SHEAVES

THESE are a few "tough service" parts, representative of countless types of castings showing actual savings when made of the special steel—Farrell's 85.

Discerning engineers and designers repeatedly take advantage of its high physical properties in strengthening vital spots of their equipment because it affords real resisting powers to shock, load, overloading, impact, wear and abrasion.

A small trial will serve to demonstrate the value of Farrell's 85 in your own "tough service" parts.

Ask for the loose leaf cover to fit your files, containing informative bulletins on Farrell's 85.

FARRELL - CHEEK STEEL FOUNDRY COMPANY, Sandusky, Ohio

New York Office	Philadelphia Office	Birmingham Office	Duluth Office
136 Liberty Street	401 N. Broad Street	2124 Highland Ave.	518 Providence Bldg.
Phone Hitchcock 6137	Phone Walnut 56-32	Phone 4-2393	Phone Melrose 1095-J

St. Louis Office	Detroit Office	Denver Office
907 Security Bldg.	3202 Sturtevant Ave.	3417 E. 14 Ave.
Phone Garfield 5222	Phone Longfellow 7229	Phone York 9181

FARRELL-CHEEK

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 10.50c, Conn., for copper

Sheets	
Yellow brass (high)	17.62½
Copper, hot rolled	20.37½
Lead, full sheets (cut ½c more)	8.50
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	22.50
Seamless copper	22.87½
Rods	
Yellow brass (high, full turnings)	16.00
Naval brass	16.87½
Anodes	
Copper, untrimmed	17.87½
Wire	
Yellow brass (high)	18.12½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	7.00 to 7.25
Chicago	6.50 to 6.75
Cleveland	7.75 to 8.00
St. Louis	6.25 to 6.50
Heavy Yellow Brass	
New York	4.75 to 5.00
Heavy Copper and Wire	
New York	8.00 to 8.25
Boston	7.50 to 7.75
Chicago	7.25 to 7.75
Cleveland	7.50 to 8.00
St. Louis	6.50 to 7.00
Red Brass Borings	
New York	6.50 to 7.00
Yellow Brass Tubing	
Cleveland	4.50 to 5.00
Light Copper	
New York	7.00 to 7.50
Chicago	6.50 to 6.75
Cleveland	6.75 to 7.00
St. Louis	6.50
Light Brass	
Boston	3.50 to 3.75
Chicago	4.25 to 4.50
Cleveland	3.25 to 3.50
St. Louis	3.50 to 3.75
Zinc	
New York	1.75 to 2.00
Cleveland	1.25 to 1.50
St. Louis	2.00
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clippings, hard, Cleveland	9.00 to 10.00
Borings, Cleveland	5.00 to 5.50
Mixed cast, Cleveland	5.25 to 5.50
Mixed cast, Boston	4.00 to 4.50
Mixed cast, St. Louis	4.25

Secondary Metals

Remelt aluminum No. 12	11.00 to 12.00
Brass ingots, 85-5-5-5	10.25

Metals

Further Strength Develops In Prices—Domestic Buying Still Lags—Copper Exports Active

New York—Prices of nonferrous metals have strengthened decidedly during the past week. The rise has resulted more from the influence of the stock market and foreign activity than domestic demand. Copper, zinc and tin prices have touched the highest levels in two months.

Strength has been encouraged by the growing belief that business at large is improving. There are some evidences of gains in domestic production of metals but these are slight and spotty.

Brass and copper products have been marked up. Most brass products and copper wire are up ¼-cent, and copper products and alloys over 85 per cent copper ⅜-cent. Changes were initiated by mills formerly referred to as independents though this term has become a misnomer since nearly all mills have become affiliated with copper producers.

Copper—Good export sales have put the price up to 10.50c, Connecticut. Domestic business has been light. Statistics in the past few months has shown regular reductions in stocks, and while February figures are not yet compiled, producers assert that world consumption is running larger than production.

Zinc—A little improvement in demand has caused the prime western market to recover from 3.95c to 4.05c, East St. Louis, on prompt. Only a moderate and temporary improvement in demand was necessary to remove sales pressure. The market appears still to be retarded by slack galvanizing operations. Production continues curtailed.

Tin—Weak statistics have not prevented tin prices from recovering. Consumers, however, have not cared to buy much metal. Effect of an increase of nearly 5000 tons in world visible supplies has been offset by news that the international committee of producers have agreed on complete details for immediate curtailment of output and exports to current world consumption.

Lead—New business has become quiet but prices are steady and supported by a strong market in London.

Aluminum—Orders have improved a little but prices are unchanged.

By-Products in Larger Demand; Less Shading

New York—While some shading continues on distillates demand has improved and there are indications the market is firmer. Considerable benzol continues to move at 19c, but less toluol is selling at 28c. Demand for toluol has increased sharply from automotive sources, the Ford Motor Co. buying much heavier for March. The chemical manufacturing industries also are more active. Orders are being received from buyers who have been out of the market for some months. Phenol is unchanged with some shading noted. Naphthalene shipments against contracts are active. A fair volume of spot business is reported, generally at unchanged quotations. Sulphate of ammonia buying is slightly heavier.

Coke By-Products

	Spot
Per Gallon, Producers' Plants, Tank Lots	
Pure benzol	$0.19 to 0.20
90 per cent benzol	0.19 to 0.20
Toluol	0.29
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.85 to $1.90

Quicksilver Fairly Active

New York—Quicksilver is moderately active at $102 to $103 a flask.

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
Feb. 25	10.25	10.37½	10.00	27.17½	27.47½	4.60	4.35	3.95	22.90	7.05	35.00
Feb. 26	10.25	10.37½	10.00	27.00	27.35	4.60	4.35	4.00	22.90	7.05	35.00
Feb. 27	10.25	10.37½	10.00	27.00	27.30	4.60	4.35	4.00	22.90	7.05	35.00
Feb. 28	10.37½	10.50	10.00	26.90	27.25	4.60	4.35	4.00	22.90	7.05	35.00
March 2	10.50	10.62½	10.25	27.25	27.62½	4.60	4.35	4.05	22.90	7.00	35.00
March 3	10.50	10.62½	10.25	26.87½	27.30	4.60	4.35	4.05	22.90	7.00	35.00

Europe

British Steel Business Is Improving — Continent Quiet— Belgians Consider Wage Cut

London—(*By Cable*)—British steelworks' orders are improving moderately and a more cheerful attitude is apparent in the industry. The firmer price situation in the tin market has stimulated the market for Welsh tin plate. A Sheffield firm has booked a contract for railroad tires and axles for shipment to Buenos Aires, Argentina. A Middlesbrough company has received a substantial order for rail accessories; shipbuilding on the Clyde is a little more active. The pig iron market is quiet. February exports from Middlesbrough were at a lower average than in January.

Today's reports from STEEL'S correspondents at Paris, Belgium and Berlin show the continental situation is unchanged, prices still tending downward. A slight gain in domestic orders is reported in Germany. Belgian steelmakers have arranged a meeting to discuss wage revisions.

Conditions Grow Worse in Steel Markets of Europe

London—From all centers of European production reports are to the effect that iron and steel export trade shows no signs of recovery. In Great Britain some orders from Canada recently were placed, but steel exports are abnormally low. Imports of Continental pig iron continue, largely against old contracts. A leading British firm which has taken pains to combat Continental competition states that during the past two or three weeks the situation has considerably improved.

The Continental situation still has considerable influence on the British market, however, owing to the weakness of Continental prices, which bears on the whole industry. It is reported from the Tees-side that January shipments of iron and steel were the lowest recorded since the coal strike period of 1926. On the other hand, pig iron exports from Great Britain in January were substantially higher than in December, 1930.

From Brussels no improvement over the previous week is noted. The market is weak and the volume of inquiries below normal for the time of year. Only a small proportion of the demand materializes into definite orders. Prices fluctuate according to the importance of the contract. In France the situation has considerably deteriorated since the beginning of the year, and for the first time for a number of years unemployment has reached a high figure. In view of the fact that out-of-work insurance is in no way comparable with the situation which exists in Great Britain and in Germany, accurate statistical information is not available. It is reported by the French minister of labor at Geneva that the total figure of unemployment, including men working on short time, exceeds 1,350,000. It is noticeable that this increase in unemployment has developed quickly. Iron and steel export business in France is slack, and a number of works now are operating on short time.

In Germany, export business remains dull, and although published prices are higher than those quoted in France, Belgium and Luxemburg, some business is being transacted, but at the cost of substantial concessions.

An idea of the position of the market can be obtained by comparing the prices of a number of current commodities as quoted on the Continent Feb. 11 and one month previously. Two-inch billets now are £3 10s 6d ($17.05), against £3 12s ($17.40) Jan. 8; merchant bars, £3 19s 6d ($19), against £4 4s ($20.35); beams, £3 10s 6d ($17.05), against £3 13s 6d ($17.85); hoops and bands, £4 10s 6d ($22), against £4 12s 6d ($22.45); ¼-inch plates, £4 10s 9d ($22.10), against £4 14s 9d ($23.20); sheets, 24-gage, £7 18s ($38.25), against £8, 3s 9d ($39.50).

Current Iron and Steel Prices of Europe

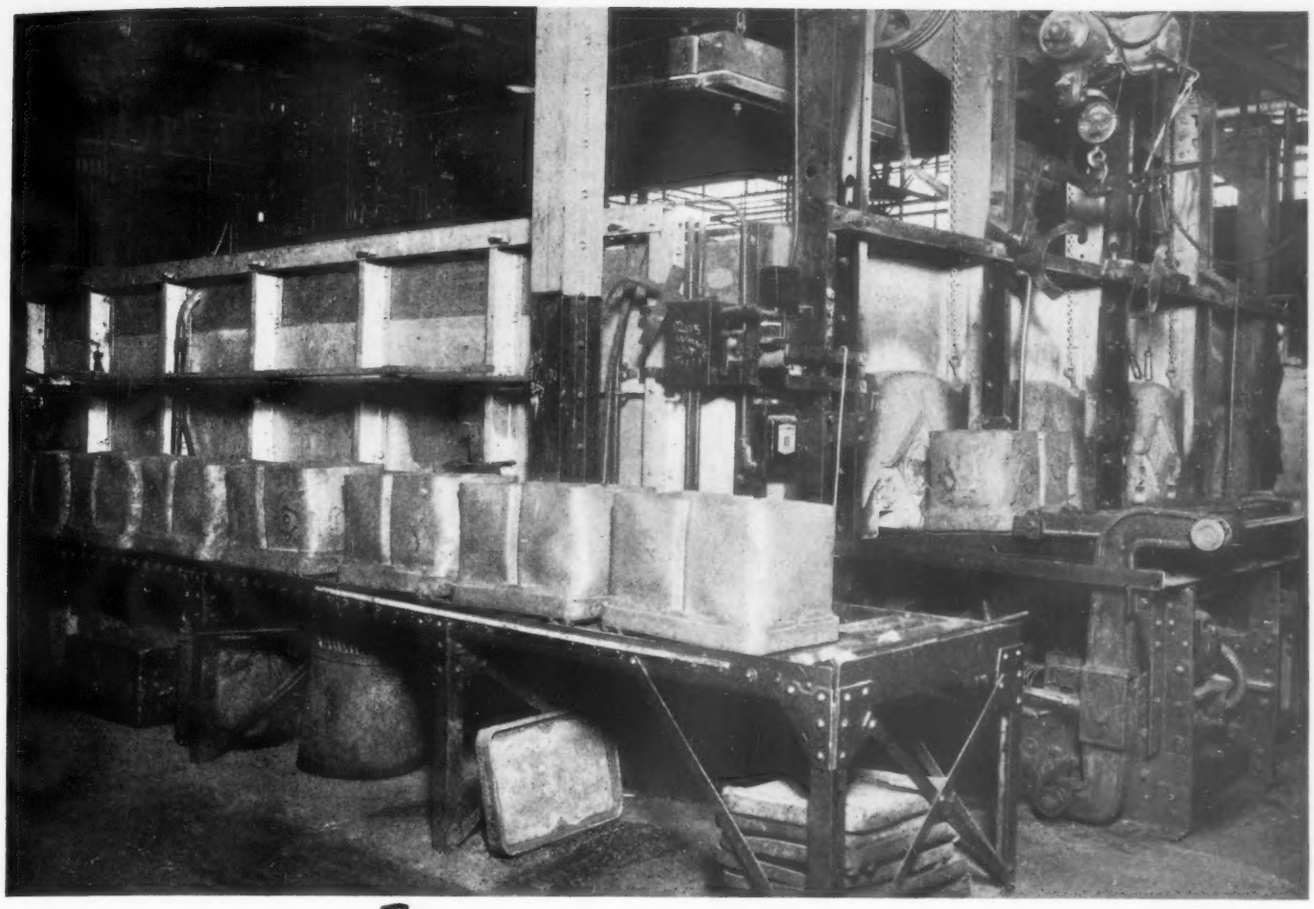
Dollars at Rates of Exchange, March 2	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f.o.b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3**.....	$14.22	2 18 6*	$12.64	2 12 0	$12.64	2 12 0	$12.15	2 10 0
Basic-bessemer.....	14.58	3 0 0†	11.91	2 9 0	11.91	2 9 0	13.37	2 15 0
Hematite, Phos. .02-.05	17.01	3 10 0	.....	.....	.....	.....	17.01	3 10 0
SEMIFINISHED STEEL								
Billets.....	$26.73	5 10 0	$16.77	3 9 0	$16.77	3 9 0	$17.50	3 12 0
Wire rods.....	41.31	8 10 0	29.16	6 0 0	29.16	6 0 0	29.16	6 0 0
FINISHED STEEL								
Standard rails.....	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars.....	1.68c	7 15 0	.86	3 18 0	.86	3 18 0	.87c	3 19 0
Structural shapes.....	1.68c	7 15 0	.78c	3 10 6	.78c	3 10 6	.79c	3 11 6
Plates.....	1.79c	8 5 0	1.00c	4 11 0	1.00c	4 11 0	1.05c	4 15 0
Sheets, black, 24 gage	1.90c	8 15 0	1.74c	7 18 0	1.74c	7 18 0	1.93c	8 15 0
Sheets, gal., 24 ga. corr.	2.44c	11 5 0	2.27c	10 6 3	2.27c	10 6 3	2.31c	10 10 0
Bands and strips.....	2.06c	9 10 0	1.00c	4 10 6	1.00c	4 10 6	1.01c	4 12 0
Plain wire, base.....	2.06c	9 10 0	1.13c	5 2 6	1.13c	5 2 6	1.18c	5 7 6
Galvanized wire, base..	2.39c	11 0 0	1.49c	6 15 0	1.49c	6 15 0	1.45c	6 12 0
Wire nails, base.....	2.39c	11 0 0	1.16c	5 5 0	1.16c	5 5 0	1.21c	5 10 0
Tin plate, box 108 lb...	$ 3.77	0 15 6	.....	.....	.....	.....	$ 8.26	1 14 0

			French Francs		Belgian Francs		Renten Marks	
Domestic Prices at Works or Furnace—Last Reported								
Fdy. No. 3 Pig Iron**	$14.22	2 18 6	$11.37	290(2)	$13.11	470	$18.55	78
Basic pig iron.....	14.58	3 0 0	12.74	325(1)	12.28	440	20.33	85.50
Furnace Coke.....	2.92	0 12 0	6.19	158	5.02	180	5.09	21.40
Billets.....	26.73	5 10 0	19.21	490	18.00	645	26.28	110.50
Standard rails.....	1.79c	8 5 0	1.41c	785	1.57c	1,210	1.36c	127
Merchant bars.....	1.68c	7 15 0	.97c	540	.93c	715	1.37c	128
Shapes.....	1.90c	8 15 0	.99c	550	.92c	705	1.34c	125
Plates.....	1.95c	9 0 0‡	1.37c	760	1.09c	835	1.57c	147
Sheets, black, 24 gage	1.90c	8 15 0	2.33c	1,295	2.34c	1,800	1.25c	117
Sheets, gal. 24 ga., corr.	2.39c	11 0 0	2.80c	1,555	2.73c	2,100	3.53c	330
Plain wire.....	2.06c	9 10 0	2.16c	1,200	2.15c	1,650	2.21c	207
Bands and strips.....	2.06c	9 10 0	1.25c	695	1.27c	975	1.58c	148

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.92) f. o. b. Ferromanganese £16 9s 0d ($79.95) delivered Atlantic seaboard, duty-paid. German ferromanganese £12 5s 0d ($59.54) f. o. b.; **Silicon 2.50-3.00. British quotations are for basic openhearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.

British Output at New Low

London—During December the number of furnaces in operation in Great Britain fell to 76; of the 16 furnaces which ceased operations, 11 were damped down. The December, 1930, output was the lowest for the year. The December, 1930, output of



In Service more than 4,000 hours -

These sheet "Nichrome" boxes with cast "Nichrome" covers have been in service for over 4,000 hours and they are still in fairly good condition.

The best practice is being adopted by hundreds of manufacturers because the best practice comes from experience, and this plant, together with hundreds of other plants, has learned by experience that "Nichrome" carburizing containers assure satisfactory results.

More than 4,000 hours' service is the satisfactory result obtained in the above plant by the use of sheet "Nichrome" carburizing boxes with cast "Nichrome" bases.

The remarkable resistance to oxidation of "Nichrome" carburizing containers makes for long life and uniform results in the finished case.

You, too, can adopt the best practice by using cast or sheet "Nichrome" carburizing boxes, pots or other heat resisting parts, no matter whatyour problem is.

Write for your copy of our brochure showing "Nichrome" installations.

All nickel chromium carburizing containers are manufactured under Henderson patent No. 1,270,519, owned by Driver-Harris Company, Harrison, New Jersey.
Br. Offices: Chicago, Detroit, Cleveland. Plants: Harrison & Morristown, N. J., England, France, Italy.

TRADE MARK REG. U. S. PAT. OFF.

Nichrome

—the original heat resisting alloy—

steel ingots and castings was also the lowest for the year.

December production brings the total output of pig iron for 1930 to 6,196,800 gross tons, and that of steel to 7,298,500 tons, compared with 7,589,300 tons and 9,636,200 tons, respectively, for 1929. Comparisons follow, in gross tons:

(Gross tons)

Mon. ave.	Act. Fur. on last day	Pig iron	Steel ingots and castings
1913	338(*)	855,000	638,600
1927	149	607,700	758,100
1928	132	550,900	710,400
1929	162	631,600	804,560
1930			
Jan.	159	560,000	771,100
Feb.	162	607,000	776,400
March	157	665,800	826,100
April	151	619,600	696,100
May	141	614,500	692,800
June	133	563,200	600,100
July	105	486,100	621,400
Aug.	104	416,700	451,300
Sept.	104	425,000	580,600
Oct.	96	415,000	512,500
Nov.	92	384,100	433,700
Dec.	76	349,800	337,200

*Average for year.

Belgian Pig Iron Control Depends on French Prices

Brussels—The Belgian foundry pig iron syndicate has been renewed for six months. The period of the renewal is limited because further prolongation depends on the future of the French pig iron syndicate, which it not yet decided. If the French syndicate is not reorganized within the next six months, the Belgian syndicate also will be definitely dissolved.

This Belgian syndicate controls the sales of foundry pig iron in the domestic market and fixes prices at which foundry pig iron is sold in Belgium. However, this depends to a large extent on the quotations prevailing in France. Under present circumstances the pig iron export market is free, and it is not possible for export prices to be fixed until the French syndicate has been reformed and an agreement reached between French, Belgian and Luxemburg producers.

It is reported from Luxemburg that the iron and steel market has shown no signs of improvement since the beginning of February, and, in fact, the situation has become worse on account of the weakness of prices. Forecasts are mostly pessimistic. The number of men working in the Luxemburg iron and steel industry at the end of December, 1930, was 40,538, compared with 43,973 at the end of December, 1929, showing a decrease of 7.81 per cent.

German Production at Low

Berlin—Provisional statistics giving the iron and steel production of Germany in 1930 show that such a low level has not been equalled since 1924. The production of steel ingots and castings in 1930 decreased 29.2 per cent from 1929. Production of finished steel in 1930 decreased 27.8 per cent from 1929. Output of pig iron in 1930 was 27.6 per cent under 1929. Comparisons follow, in metric tons:

Mon. ave.	Pig iron	Steel ingots and castings	Finished steel
1913*	909,640	993,640	970,240
1927	1,091,875	1,359,225	1,069,930
1928	984,700	1,209,770	880,690
1929	1,116,730	1,353,820	940,425
1930			
Jan.	1,092,206	1,275,023	896,076
Feb.	964,517	1,176,435	797,899
March	1,007,576	1,201,206	834,349
April	901,358	1,033,383	737,355
May	859,657	1,034,088	735,741
June	767,395	859,310	603,378
July	770,928	905,763	664,401
August	739,083	896,514	619,861
Sept.	652,863	814,117	576,948
Oct.	687,497	856,433	622,617
Nov.	636,564	738,740	522,702
Dec.	614,844	743,679	533,029
Total	9,694,509	11,538,582	8,151,121

*Present boundaries.

French Steel Market Loses Lead and Suffers Decline

Paris—There is no improvement in the French iron and steel market. The volume of inquiries is lessening and prices continue to fall. Jobbers are not keen to hold extensive stocks, and fabricators, who know that they can obtain material at short notice, are following a hand-to-mouth policy and keenly discussing prices; when they are not ordering material for immediate delivery they try to obtain concessions of as much as 30 francs ($1.70) per ton. Thus the market is in a confused state as to prices, largely due to lack of co-operation between producers.

The railroad companies recently announced that they had sustained important losses during the past financial year, and it now is rumored that transportation rates will be increased. It is hoped, however, that the government may reduce taxation on transportation rates, which would alleviate the position. Work in the mines is slowing down, but stocks, nevertheless, continue to accumulate. In the country generally it now is ascertained that there are over 30,000 men totally unemployed, about 1,000,000 men partially unemployed, and steps now are being taken to eliminate foreign labor at the expiration of contract.

Inquiry for structural steel is low, and many inquiries fail to materialize into orders. It is undoubted that 620 francs ($24.25) fixed by the comptoir for beams is too high in comparison with the price of other rolled products, and this enables Belgian mills to make inroads into the French market, not only in the border districts, but even as far south as Nantes and Bordeaux, and in the Paris district. Furthermore, those works which are not affiliated with the comptoir, and particularly the Acieries de Pompey, are selling under the syndicate price. In view of this position, the comptoir now has decided to reduce the price to 550 francs ($21.50). Jobbers had anticipated this reduction, as for the past few days they had already begun to quote below the comptoir rate.

The semifinished steel syndicate has received some orders, but at low prices. Merchant bars are sold at 520 to 530 francs ($20.35 and $20.70), but for important specifications such works as de Wendel and Knutange, and also selling agencies such as Columeta and Davum, accept 500 francs ($19.55), all these prices applying to the eastern regions; in the north the quotations range from 530 to 540 francs ($20.70 to $21.15). In the east of France small angles are sold as low as 480 francs ($18.75), and reinforced concrete bars at 475 francs ($18.55). The wide margin that existed until now between the price of beams and reinforced concrete bars was such that a number of buildings originally planned to be erected in steel will be built in reinforced concrete; this applies particularly to a considerable extension to a large department store in Paris.

In the plate and sheet market the comptoir prices again are too high, and, as a result, business goes to non-affiliated firms and to Belgian mills. For hoops and bands the works of La Chiers and La Providence are quoting 630 francs ($24.65) basis price, and accept concessions of 20 to 30 francs for interesting orders. The market generally is unsatisfactory, and present domestic prices now have come down to the level of export prices, with the result that many works are doing business at a loss.

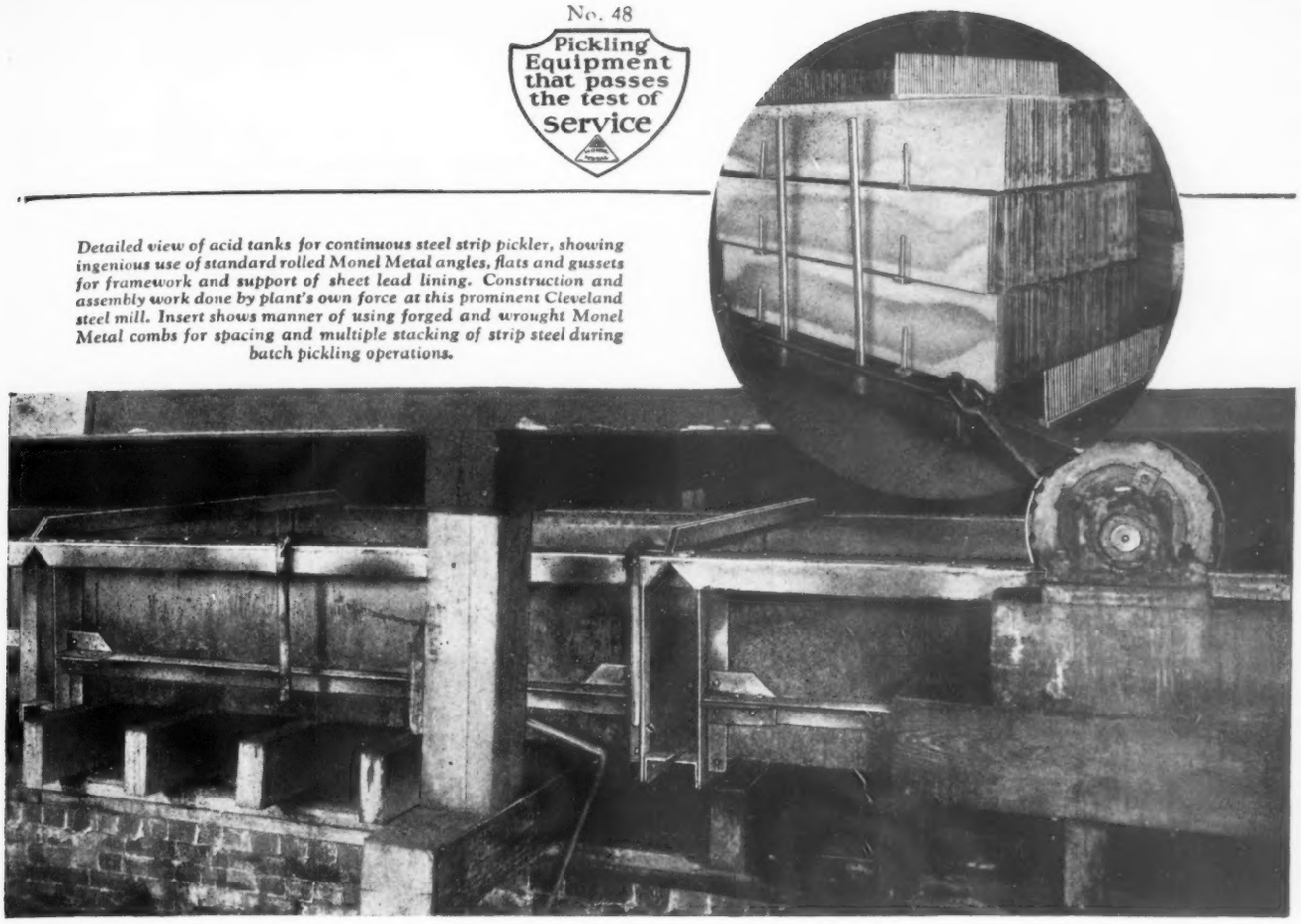
British Trade at Low Ebb

London—British exports of iron and steel in 1930 declined 41.6 per cent from 1929 and imports increased 3 per cent. For December exports were markedly below those of November and imports showed a gain. Comparisons follow, in gross tons:

	—Imports—		—Exports—	
Mon. ave.	Pig iron and ferro-alloys	Other iron and steel	Pig iron and ferro-alloys	Other iron and steel
1927	50,715	316,455	27,580	322,100
1928	9,935	231,390	37,895	317,210
1929	12,310	222,410	45,430	319,520
1930				
Jan.	15,770	294,546	40,445	311,401
Feb.	24,252	235,144	26,865	267,422
Mar.	23,186	257,106	39,461	298,253
April	21,254	213,552	30,100	237,895
May	23,039	210,686	32,586	262,143
June	25,031	189,473	21,588	229,381
July	25,674	173,114	25,086	278,358
Aug.	21,931	173,473	22,026	218,828
Sept.	30,484	193,345	13,459	186,821
Oct.	31,395	233,085	26,177	238,193
Nov.	26,410	183,359	20,074	183,845
Dec.	36,023	247,015	19,458	150,086

No. 48

Pickling Equipment that passes the test of service



Detailed view of acid tanks for continuous steel strip pickler, showing ingenious use of standard rolled Monel Metal angles, flats and gussets for framework and support of sheet lead lining. Construction and assembly work done by plant's own force at this prominent Cleveland steel mill. Insert shows manner of using forged and wrought Monel Metal combs for spacing and multiple stacking of strip steel during batch pickling operations.

Progressive processors prefer standard Monel Metal shapes for **HEAVY DUTY** *pickling equipment . . . . .*

WHEN pickling equipment must be constructed of large sections or is intended for handling heavy loads, modern processors have found that it pays to use Monel Metal for vital parts.

The advantages of using standard Monel Metal shapes for heavy duty pickling equipment are manifold. Monel Metal's greater structural strength, due to its high Nickel content and uniform rolled structure, gives a greater factor of safety against danger of fatigue failure. Its high corrosion-resistance to pickling solutions promotes cleaner work and also contributes to longer life of the equipment.

Because Monel Metal is available in standard forms, construction of pickling units is greatly simplified. It enables processors to fabricate their own equipment on the job to fit individual pickling room requirements. This often means a big saving in labor, time and expense.

When planning your next equipment installation, remember that "Nickel alloys perform better longer"—and bear in mind that Monel Metal is a high Nickel alloy. Let us send you further information concerning Monel Metal's remarkable performance in pickling service.

A HIGH NICKEL ALLOY

MONEL METAL

NICKEL ALLOYS PERFORM BETTER LONGER

INCO MONEL METAL TRADE MARK

Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

Machinery

REPORTS ranging from those indicating drops below January levels to those indicating slowly increasing improvement over January, are abroad this week. In no cases have orders of sensational size been booked. Government departments and Russian interests continue to stand out in the quiet market as relatively large buyers of machine tools. At a time when annual reports showing deficits are no disgrace, the margin of profit and strong cash position reported by a leading Cleveland company presents one of the outstanding achievements of the past year. Kearney & Trecker Corp.'s "gross order barometer" indicates its first upturn in 18 months.

New York — Buying of machine tool equipment in February compared favorably with the previous month, according to most dealers and builders. There are exceptions, however, some reporting a slight drop. The market is best described as spotty, although inquiry is holding up well, especially for heavier tools. Activity upstate continues to lead that in the metropolitan area. Two railroad lists, previously announced as being issued, still are pending.

Inquiry and buying continue to be well spread, covering a wide range of industries. This includes a few tools for electrical manufacturing centers. Several machine builders gradually have increased working schedules and have called in more employes. This is true particularly in the case of one of the leading companies in Connecticut. The grinding machinery outlook is brighter, with prospect of more activity in the Detroit district, which is forecast by increased production schedules by makers of automotive parts.

Worcester, Mass.—While machinery buyers continue to talk business, they are as yet placing few orders. The navy department and Russian interests, which continue to be active prospects, are responsible for most orders of any importance. Construction delays, mentioned last week, still are holding up the placing of orders for machinery for the new plant of Simonds Saw & Steel Co., Fitchburg, Mass. Much of this equipment will be of special design.

Grinding machinery manufacturers are keeping moderately busy completing Russian orders. In the meantime, more of this Russian business is being obtained and it continues to be the mainstay of the grinder industry.

Pittsburgh—Inquiry for machine tools continues well ahead of the rate a month ago and, although orders lack definite improvement, sellers continue optimistic regarding future activity. New work is made up mostly of small lots with the exception of an inquiry from Westinghouse Electric & Mfg. Co. calling for five miscellaneous tools. Railroads and steel companies still are inactive in tool purchases as well as in new inquiry.

Cleveland—Encouraged by continuation of active inquiry, machine tool builders and dealers continue to pursue elusive business with undimmed faith in early improvement. Orders for parts and tools are gaining in volume, but prospects other than those for single machines cannot be prevailed upon to close under existing conditions. Exceptions are certain manufacturers of automotive parts, but even there stiff competition with used tools has to be faced.

Announcements of radically improved, and in some cases of entirely new, production machine tools continue to appear with great frequency, and rumors are current of even more startling developments. Most of the new machines are designed for effective utilization of cemented carbide tools.

The annual report of the National Acme Co., showing a margin of profit for 1930 as well as substantial cash reserves, is being commented upon widely as setting forth an unusual achievement during so difficult a year.

Chicago—February machine tool sales were below the light January volume for most dealers in this territory, while others found business about the same, and a few made slight gains. More orders are expected to be active in the Milwaukee district early in March. An excavating equipment maker in that district has just closed on a 5-foot radial drill and three lathes. No heavy machine tool orders of consequence were closed in the Chicago district during the week.

Colorado Fuel & Iron Co. is likely to close soon on $20,000 to $25,000 worth of equipment for a steel tower fabricating plant at Pueblo, Colo., this list including several punch and shear machines and a pneumatic riveter. A large number of production tools of the Apex Lamp & Mfg. Co., 2635 South Wabash avenue, Chicago, were sold at auction the latter part of last week.

The "gross orders barometer chart" kept for many years by Kearney & Trecker Corp., milling machines, Milwaukee, recorded its first upturn in approximately 18 months during the third week of February. Although the machine tool industry as a whole had not yet reported an upturn, E. J. Kearney, secretary and treasurer of the company, believes that such good news will be found in the industry's February statistics. The Kearney & Trecker chart in 1920-1921 recorded a downward trend for 18 months, followed by an upturn for a similar period and Mr. Kearney expresses the opinion that history now is repeating itself.

Exports of Metalworking Machinery

	January		Six months ending December	
	1931	1930	1930	1929
Engine lathes	47	58	332	432
Turret lathes	26	33	124	240
Other lathes	47	93	211	459
Vertical boring mills and chucking machines	16	27	174	70
Thread-cutting and automatic screw machines	17	90	237	577
Knee and column type milling machines	8	44	115	307
Other milling machines	30	125	229	304
Gear-cutting machines	98	42	136	186
Vertical drilling machines	12	81	123	180
Radial drilling machines	11	3	34	79
Other drilling machines	72	281	489	1,129
Planers and shapers	36	45	82	222
Surface grinding machines	9	26	31	172
External cylindrical grinding machines	13	51	159	415
Internal grinding machines	11	26	72	218
Tool grinding, cutter grinding, and universal grinding machines	97	224	602	575
Pneumatic portable tools	885	1,964	7,972	12,446
Chucks for machine tools	459	2,444	5,445	10,589

Mirrors of Motordom

(*Concluded from Page* 33)

ten days, is taking off Nos. 1 and 2 furnaces for repairs, leaving a net of four in operation. The two open hearths being temporarily laid off have been in continuous operation since late in August, 1930.

Briggs Body, having added considerably more men at its pressed steel division in Ford's old Highland Park plant, in February more than doubled its January rate for all its divisions. Murray, too, is busy and Kelsey-Hayes has all but one large stamping machine engaged.

◆

Though the 400-ton open-hearth furnace which Ford proposed to build some time ago for scrapping cars is as yet in a contemplated state, three disassembly lines in the River Rouge open hearth building have just rounded out an even year's service in wrenching apart old wrecks. The plan had its inception in February, 1930.

To and including Feb. 23, 49,089 cars had been scrapped and melted under this Ford plan. From this number 21,500 tons of steel were recovered.

For the present, the operation works 5 days weekly, 42 men to an 8-hour shift, two shifts, or 16 hours daily.

Though as many as 400 cars have been broken up in a day, at present about 270 cars daily are being stripped of their parts, the hulk put into a 22-ton press, the resultant "pancake" slashed into three pieces by a giant cutting shear Ford once used to scrap plates from Emergency Fleet vessels and then carted away on the third disassembly line to the open-hearth furnace.

Forgotten Names Appear in Final March of Old Cars

Of these three lines, two are used for dismantling purposes, one for Fords and one for other cars. The third carries scrap iron and steel to one of the ten open-hearth furnaces, and salvaged material such as batteries, tires and floorboards, to waiting trucks.

The derelicts are purchased for a flat sum of $20, with no restriction to age, condition or make of car. The only requirement is that each must have something resembling tires and battery and that the car must be delivered by a Ford dealer to the plant.

So far more than 60 different makes of cars have been received and among them besides many well known and still made are such forgotten makes as Jeffery, Gray, Earl, Columbia, Apperson, Velie, Bay State, Dort, Case, Scripps-Booth, Jewett, Elgin, Briscoe and Saxon.

The number of cars scrapped depends often on the supply of old cars and the rate at which they are brought into the field near the open-hearth building. Thus far the program has been confined largely to the Detroit metropolitan area and cars are imported only so far as they can be hauled, Ford dealers hauling them to River Rouge, five, six and seven on long-reach truck trailers, and driving away with new Fords.

Work in salvaging materials other than steel has been likewise successful. Every material finds some use in reclamation, from glass for remelting in the Rouge glass plant to aprons for Ford laborers fashioned from curtains and tops.

Perhaps some day attention may be centered on the "disassembly" rather than the assembly line, with a germ for such a thought in some 8,000,000 cars that exist today in this country that were bought before 1925!

Screen Grille Radiator Covers Show New Ideas

The latest in screen grille radiator covers is being made for Graham-Paige.

Screen-grille and radiator shell are one piece of steel, a stamping made in 13 to 14 operations. Material is No.19 gage.

The shell is formed with the grille stamped out. Appearance of vertical slots in the grille is obtained the more accurately by the rounded edge outward resembling the thin tube in the mesh work of this radiator-covering device that seized 1930 and 1931 models by storm. On the inside of the grille the vertical slots are left open without the curved finish. These slots are but 5/16-inch apart.

The grille could be stamped with checker-work or any design if desired. Once stamped, the entire piece is chromium-plated and shell, grille and all fits on the front of the hood.

Three or four other auto makers may incorporate this device on their models. At present Mullins Mfg. Co., Salem, O., is making the combined one-piece shell and grille. The company once made shells for Marmon and Franklin.

◆

Ford seems to be cleaning up stocks of corrosion-resistant steel sheets before going whole-heartedly to the carbon steel weld insert on Model A's radiator shell. Some model A's are now being assembled with the insert, some without. Motor Wheel makes some of the newer shells, which are made in a roll operation replacing the former draw.

Reo is making some changes in its Flying Cloud series, with a free-wheeling transmission reported a possibility. . . . Olds had a small 8-cylinder motor ready at show time, but it may be some time before it is formally introduced. . . . Lycoming Foundry & Machine Co. is making 12-cylinder engines for a New Cord model, forecast in these columns to be presented by the Auburn Co. . . . Austin will form a subsidiary company which will run and maintain fleets of Austin cars for large corporations. The subsidiary is expected to take 500 Austins under a 2-year contract and a Detroit utility concern is rumored to have negotiated for about 100 Austins on the basis of 4 cents a mile.

Obituaries

(*Concluded from Page* 31)

nati branch of Hickman, Williams & Co. Inc., died Feb. 17.

□ □ □

Charles A. Fisher, 65, former assistant shipping commissioner of the Lake Carriers' association, Cleveland, died recently.

□ □ □

Charles A. Thompson, inventor, and founder of Thompson Machine Co., Belleville, N. J., died Feb. 13. He was born in Edinburgh, Scotland.

□ □ □

R. J. Doty, 47, plant manager since 1928 of Reading Steel Casting Co., Reading, Pa., died Feb. 24. He formerly was connected with Sivyer Steel Casting Co., Milwaukee, 1917 to 1927, rising from superintendent in charge of operations to vice president, works manager and director in 1922.

□ □ □

Lucius M. Wainwright, 71, president of the Diamond Chain & Mfg. Co., Indianapolis, died Feb. 24 at his winter home, Miami Beach, Fla. He became president of the Central Cycle Mfg. Co. in 1890, and in 1900 was made manager of the Diamond Chain plant of the American Bicycle Co., organizing the Diamond Chain & Mfg. Co. to take over that plant in 1905.

□ □ □

George H. Friesel, 42, treasurer, secretary and director of United Engineering & Foundry Co., Pittsburgh, died at Baltimore Feb. 22. Born in Pittsburgh, he received his early education there. He was first employed at Frank-Kneeland works of the United company in 1905 as a member of the accounting department. In February, 1914, he had charge of cost accounting for Best Mfg. Co., Oakmont, Pa., and in December, 1915, became secretary to the manager of ordnance for Poole Engineering & Machine Co., Baltimore. Mr. Friesel again became associated with the United company in October, 1916, as chief clerk in the chilled roll foundry at Vandergrift, Pa., and in 1918 was elected auditor. In 1923 the duties of treasurer were added by election and in 1929 he also was elected secretary.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

NEW CANAAN, CONN.—City board of education will award contract for the construction of a junior high school, to include a shop. Cost is estimated at $250,000.

WEST SPRINGFIELD, MASS.—J. R. Fausey, superintendent of schools, 46 Cooper street, plans erection of a new vocational school. Cost is estimated at $150,000.

New York

FLUSHING—A. Blandel, Brookville and Conduit boulevards, plans to build a 2-story repair shop, 50 x 100 feet. Plans are private. Estimated cost, $40,000.

NEW YORK—Molins Machine Co. has been incorporated with $50,000 capital by H. Goldman, 120 Broadway, to deal in tools.

NORTH TONAWANDA—Arthur J. Slade has a franchise to erect a steam production and distribution plant. Construction is to be started in the near future.

Pennsylvania

ERIE—International Automatic Supply Co. has leased the plant formerly occupied by the Zurn Mfg. Co. and will begin production of automatic vending machines.

PHILADELPHIA—Philadelphia Rapid Transit Co., Mitten building, has a building permit for shop alterations at Kensington and Cumberland streets, to cost $10,000.

PHILADELPHIA—Philadelphia Electric Co., 1000 Chestnut street, has a building permit for the erection of a power house to be built at Adams avenue and Tabor road. Contract is held by United Engineers & Constructors Inc., 12 North Broad street. Cost is estimated at $100,000.

New Jersey

HARRISON — Walker Turner Co. Inc., 66 York street, Jersey City, N. J., is reported to have acquired a plant site here, including four units, the largest being 180 x 275 feet. Alterations and improvements costing about $30,000 will be made. Company manufactures tools.

JERSEY CITY—Triangle Wire Die Co. Inc. has been incorporated with $100,000 capital by Henn & Burr, 665 Newark avenue, to manufacture dies and tools.

Ohio

CLEVELAND—National Metal Abrasive Co., with offices at 318 Plymouth building, has been organized by Henry A. Schneider and associates. First plant unit is being built at 3560 Norton road northwest. Structure is to be 70 x 150 feet and will be ready for operation about March 15. Product will be used in the foundry, marble and granite trades.

COLUMBUS—Vorys Bros. Inc., 215 East Russell street, advises that bids have been closed for the construction of the shop and warehouse recently noted as planned. (Noted Feb. 26.)

Indiana

ANDERSON — Smith Steel Casting Co. has been organized with $25,000 capital by K. Smith and C. Million. Company will be located in buildings formerly occupied by the Lavelle Foundry Co.

AUBURN—Riecke Metal Products Corp. has resumed operations following a recent fire which damaged the plant and stock to the extent of $20,000. Company manufactures pressed steel flanges, made-in seals, pressed steel plugs and sealing rings used by oil refineries. Irvin H. Rieke is president.

EVANSVILLE — National Battery Co., 501 North West Fourth street, will build a service building and repair shop at an estimated cost of $40,000. A. E. Neucks, Old State Bank building, is architect. Company manufactures electric storage batteries.

INDIANAPOLIS—Eagle Machine Co. Inc., 24 North Noble street, has let contract for a new plant. Approximate cost, $40,000.

INDIANAPOLIS — Universal Gear Corp., 327 South LaSalle street, Chicago, advises that the plant leased here is at Nineteenth and Martindale avenues, and will be used for assembly only. Additional equipment or machinery will not be needed. (Noted Feb. 19.)

Michigan

DETROIT — Detroit Metallic Casket Co., 2950 Gratiot avenue, has awarded contract for a 1-story plant addition.

DETROIT—Cadillac Steel Corp., 8825 Conant avenue, has been incorporated with $20,000 capital by Lewis H. McLouth, same address, to buy, sell, cut and manufacture steel.

DETROIT—Gray Register Co., 2950 East Woodbridge street, has been incorporated with $100,000 capital by W. Campbell Moore, 7420 LaSalle street, to manufacture and sell pressed steel and electrical specialties and mechanical devices.

GRAND RAPIDS—Michigan Conveyor & Mfg. Co., 632 Front avenue, has been incorporated with $25,000 capital by John D. Traill and J. K. Kruzenga, to manufacture and sell coal conveyors.

LANSING — Ross Piston Expander Corp., 121½ Washtenaw street, recently incorporated with $25,000 capital, is establishing operations in the plant of the Michigan Screw Co. for the manufacture of an automotive device invented by Ross N. Gibson, vice president. Hugo B. Lundberg is president and Glenn Scheren secretary.

YPSILANTI—M. N. Hutton Co., Race and Factory streets, has been incorporated with $25,000 capital by Merl H. Hutton and Franklin D. Western, to manufacture and deal in radio sets.

Illinois

CHICAGO — Commonwealth Edison Co., 72 West Adams street, will equip a new substation at 11 North Wabash avenue, providing 6800 square feet of floor space.

CHICAGO—Coin Devices Inc., 343 South Dearborn street, has been incorporated with $100,000 capital by W. B. Lathrop, 343 South Dearborn street, to manufacture and deal in coin operating devices.

CHICAGO—Western Electric Co., 11 South LaSalle street, will carry forward a part of its plant expansion at once. General contract has been awarded for the foundation of a combined single story and 6-story building at the company's Hawthorne works, Twenty-sixth street and Cicero avenue, with about 250,000 square feet of floor space. Unit will be used for the manufacture of loading coils.

CHICAGO—Boduwil Co., whose incorporation recently was noted, has leased a plant at 1701 West Seventy-fourth street, according to an advice from J. Arthur Kealy, attorney, 105 West Madison street. Company will manufacture and sell sales registers, and probably will purchase lathes and other equipment. Offices will be at the plant address. A. M. Boex is president and C. O. Anderson is secretary. (Noted Feb. 26.)

PLANO—Reliance Battery Products Co., N. L. McMain president, Council Bluffs, Iowa, is considering erection of a plant here for the manufacture of batteries.

Southern States

WASHINGTON — Commissioners of the district of Columbia will receive

bids March 17 for a brake testing machine.

WASHINGTON — A. L. Flint, general purchasing officer of the Panama canal, will receive bids for traveling cranes and other equipment until May 9.

ATLANTA, GA. — Southern Spring Bed Co., 290 Hunter street southeast, has let contract for a plant addition.

SHREVEPORT, LA.—H. P. Gray, president of Derrick & Equipment Co., Cedar Grove station, has acquired a site, 60 x 100 feet, for the erection of a plant to manufacture oil and gas separators. Small unit, 30 x 60 feet, already is being utilized. Limited amounts of machinery, including lathes, drill press, shaper, etc., will be purchased.

CLARKSDALE, MISS. — Coahoma county highway department is inquiring for information on equipment for manufacturing corrugated sheet iron culverts. B. T. Collier is county engineer.

CHARLOTTE, N. C.—Boyd & Goforth, Builders building, will erect a hangar unit, 80 x 100 feet, at the municipal airport.

RALEIGH, N. C.—Dixie Culvert & Metal Co., East Point, Atlanta, Ga., is reported to have secured a plant at 801 Fayetteville street for the manufacture of corrugated metal culverts. John L. Sadler is to be in charge.

Missouri

OWENSVILLE—Blizz Mfg. Co. has been incorporated with $50,000 capital by Joseph T. Tate and Oliver P. Greenstreet, to manufacture razor blades.

ROBERTSON — Liberty Aircraft Sales & Mfg. Co., Ray E. Smith manager, Lambert-St. Louis airport, advises that production is being started on a monoplane, plant to be located in St. Louis and headquarters maintained at the airport here. (Noted Feb. 12.)

Oklahoma

BRISTOW—Reliable Boiler & Welding Co., Harry P. Alsbrook manager, has moved here from Slick, Okla., and has completed a building, 30 x 60 feet, for boiler and welding work.

MIAMI—City, W. L. Rush mayor, is developing a 180-acre airport to be leased to G. M. Coleman for use as a headquarters for a flying school. Contract for a hangar has been let.

TULSA — McGaughy Integrator Co. has been organized by J. B. McGaughy to manufacture technical equipment for the oil and gas industry. Shop building at 2316 East Fifteenth street has been leased. Machinery has been purchased.

TULSA — Magic City Improvement Co., incorporated with $500,000 capital, has leased a shop at 1414 East Fourth street for the manufacture of hydraulic pumps. Charles G. Boone will be shop manager. Walter Whiteside, president, Waite Phillips, both of Tulsa, and E. W. Marland, Ponca City, Okla., are interested in the firm.

Texas

BEAUMONT—B. & A. Welding & Machine Co., 326 Neches street, recently incorporated, will build a plant, 50 x 100 feet. L. C. Akin is general manager. (Noted Feb. 26.)

BEAUMONT—P. Millard, city manager, plans to build a 36 x 110-foot loading and unloading wharf, for which machinery and equipment will be required. Cost is estimated at $600,000. R. C. Black, city hall, is city engineer.

EAGLE PASS—Maveric county commission is having plans prepared for buildings to be erected on a site recently acquired for an airport. Hangar and shop units will be included. Cost of the project is estimated at $100,000. W. L. Rockwell is county engineer. (Noted Oct. 2.)

FT. WORTH—Double Seal Piston Ring Co., recently incorporated to manufacture piston rings, advises it will manufacture under contract for the present and will not be in the market for machinery. (Noted Feb. 19.)

PORT ARTHUR—C. H. Steele, care of Orange Car & Steel Co., Orange, Tex., is representing a company planning to establish a gray iron foundry here.

REFUGIO—Luling Oil & Gas Co., Luling, Tex., is reported planning construction of a carbon black and gasoline plant near here, to include power plant facilities.

TEMPLE — Day-Nite Sign Service Inc., 824 North Second street, is considering plans for the erection of a plant for the manufacture of signs. Proposed unit will be 60 x 120 feet and will be equipped with pipe bending and wrought iron equipment. Maturity of plans is indefinite.

Wisconsin

MADISON—Bids will be taken about April 1 for construction of two additions to East high school. One wing, 73 x 165 feet, is to be used for vocational training. Frank Riley, 22 West Dayton street, is architect. Fred W. Erickson is secretary of the board of education.

MILWAUKEE—Zenith Mfg. Corp., 619 Center street, will start work about April 1 on shop extensions costing about $115,000 with equipment. Company manufactures high speed automotive equipment, overhead valve assemblies, airplane carburetors and heaters, and other automotive devices. A. W. Sieglaff is president.

WISCONSIN RAPIDS—Transformer Converter Co., 220 Fourth avenue north, advises that the manufacture of electric arc welding machines has been started, but that no equipment or machinery will be required at present. Future needs may develop. W. F. Anderson is manager. (Noted Jan. 22.)

Pacific Coast

AVON, CALIF.—Associated Oil Co., 79 New Montgomery street, San Francisco, subsidiary of the Tidewater Associated Oil Co., 17 Battery place, New York, has let contract to Villadsen Bros., 417 Market street, San Francisco, for a 1-story boiler house. Company may build a booster station at Coalinga, Calif., at a cost of about $50,000.

LOS ANGELES—City, F. L. Weisenheimer assistant chief engineer, is having preliminary plans prepared for pumping plant construction.

LOS ANGELES — Air Transport Mfg. Co. Ltd. has been incorporated with 100,000 no par shares by E. L. Hollywood, Glendale, Calif., and A. K. Peterson, Venice, Calif., to manufacture airplanes and parts.

LOS ANGELES—Plomb Tool Co., 2209 Santa Fe avenue, M. B. Pendleton general manager, has started construction of a plant addition of 10,000 square feet. Company manufactures hand forged tools for the automotive and hardware trades.

LOS ANGELES—Crane Co., 836 South Michigan boulevard, Chicago, manufacturer of plumbing supplies, will build a plant addition, 80 x 150 feet, equipped with a traveling crane. New unit will be in addition to one, 80 x 400 feet, recently completed, according to an announcement by L. B. Peeples, vice president, 321 East Third street, Los Angeles.

OAKLAND, CALIF.—J. Raymond, 626 Seventeenth street, plans to build a 1-story metal pattern shop on Fifty-first avenue. Structure will be 25 x 25 feet.

ONTARIO, CALIF.—Seibel Air Spring Co. Inc., H. Seibel president, is starting production in a plant recently acquired, producing springs formerly bought on a contract basis.

REDLANDS, CALIF. — Johnston Tractor Co., H. A. Johnston president, proposes to build a 1-story plant at a cost of about $40,000 for the manufacture of farm tractors.

SAN DIEGO, CALIF. — Pacific Air Transport Co., subsidiary of United Aircraft & Transport Corp., has awarded contract to the Austin Co., 16112 Euclid avenue, Cleveland, for the design and construction of a depot-hangar at Lindbergh field, here. Unit will be 90 x 130 feet, and will include a machine shop. Cost is estimated at $50,000.

PORTLAND, OREG.—Stephen Carver, 174 East Seventy-first street, recently noted as in the market for water wheels and generators, advises that generators needed are to be 3-phase, 60 cycles, 2300 volts. Also will need two diesel generating plants, 120-horsepower and 200-horsepower, with alter-

nating current generators, 3-phase, 60 cycles, 2300 volts. (Noted Feb. 19.)

SEATTLE—Crane, conveying and mixing machinery will be purchased by the Pioneer Sand & Gravel Co. for a new plant at 901 Harrison street.

SEATTLE—Bureau of supplies and accounts, navy department, Washington, will receive bids until March 10 for one motor-driven grinder, cutter, reamer and drill, on schedule 5150, and for one motor-driven shaper machine on schedule 5155. Bids will be received on schedule 5186 for one screw-cutting, geared head lathe.

SPOKANE, WASH.—City council is considering participation in an airport project to be undertaken at Felts field by a commercial concern. Estimated cost, $100,000.

SPOKANE, WASH.—All-West Pump Co. has been incorporated with $25,000 capital with P. H. Williams as president, to manufacture pressure pumps. Plant of the Central Machine Works, 930 Howard street, is being used for initial operations.

Dominion of Canada

VANCOUVER, B. C.—F. T. Daly, whose foundry on Northern avenue was virtually destroyed by fire recently, has secured a site on Lulu island and will start work immediately on the erection of a new plant.

HALIFAX, N. S.—Neon Tube Gas & Electric Sign Co. is reported to be inquiring for a site to erect a plant for the manufacture of signs.

BROCKVILLE, ONT. — Cherry-Burrell Corp. of Canada Ltd., 502 Canadian Rail and Harbor Terminals building, Toronto, Ont., manufacturer of dairy machinery, will transfer machinery and equipment to its local branch plant, which will become headquarters of the company.

GALT, ONT.—Shurly-Dietrich-Atkins Co. Ltd., manufacturer of saws, advises that the plant at Hamilton, Ont., is being dismantled and stock and equipment are being moved here, where operations will be concentrated. P. G. Dietrich is president and James Shaw is secretary of the new firm, formed by the amalgamation of the Shurly-Dietrich Co. Ltd. and the E. C. Atkins Co. (Noted Feb. 19.)

HAMILTON, ONT.—W. Gordon Steel Products Ltd. has been incorporated with 10,000 no par shares by Donald H. McCannell, 55 Kent road, Toronto, Ont., as a manufacturer and dealer.

HAMILTON, ONT. — General Smelting Co. of Canada Ltd., whose incorporation recently was noted, will establish a plant here on a site leased from the Steel Co. of Canada Ltd. Building is now being erected. J. N. Pomeroy, vice president of the General Smelting Co., Stock Exchange building, Pittsburgh, is president. Company will refine zinc and later treat other metals. Five retorts with a capacity of 250 tons per month will be installed. (Noted Jan. 29.)

INGERSOLL, ONT.—Miles Automatic Furnace Fans Ltd., recently incorporated, has taken plant space and has started production of automatic furnace fans. (Noted Jan. 29.)

WALKERVILLE, ONT.—Lodge Motors Inc., 2730 Union Trust building, Detroit, has secured a plant here for the production of motors. Machining operations for parts will be carried on at the Walkerville plant.

LACHINE, QUE.—Jenkins Bros. Ltd., 615 St. Remi street west, Montreal, Que., will proceed with construction of a new foundry here as the first unit of a new plant to which operations are to be moved. Bids are being called by Ross & MacDonald, 601 Belmont street, Montreal, architects. (Noted Oct. 30.)

ST. JEROME, QUE.—Plant of the M. I. Viau & Sons Foundry Co. recently was damaged by fire. Loss is estimated at $20,000.

New Trade Publications

INDUSTRIAL CARS—Bulletin 1237 by the Atlas Car & Mfg. Co., Cleveland, describes cars and locomotives for central stations and large industrial power plants. It is illustrated and covers a wide range of equipment specially suited to this class of user.

STOKERS — Hoffman Combustion Engineering Co., 410 Ford building, Detroit, has compiled a catalog of its stokers and equipment It contains several suggested layouts for various types of boilers from 70 to 700 horsepower.

BOILER CONTROL—National Regulator Co., Chicago, presents in a current bulletin its control for high pressure boilers. This consists of steam damper regulator and over-fire control. The bulletin is well illustrated. Suggested layouts are shown.

HOSE ASSEMBLIES—J. N. Fauver Co., 31 Brady street, Detroit, manufacturer of lubrication systems and equipment, presents in a current bulletin the claims of its rubber hose assemblies for machinery and machine tools. They are designed for hydraulic and lubricating assemblies and cooling systems.

INDUSTRIAL OVENS — Foundry Equipment Co., Cleveland, in Catalog No. 31 describes and illustrates its line of Swartowt industrial ovens for japan, enamel, paint and lacquer drying, armature and insulating varnish baking and other processes requiring temperatures up to 900 degrees. Complete description of the oven design is given, with data on the use of various fuels and representative layouts.

BLOWERS—Two bulletins, 21-B-10 and 21-B-11, on its new line of blowers, have been issued by the Roots-Connersville-Wilbraham division of the Stacey Engineering Co., Connersville, Ind. This line gives a wider range of capacities than formerly offered. Two new types have been added, with anti-friction bearings and anti-friction bearing and hardened steel gears.

PULVERIZED COAL CONVEYORS—Fuller Lehigh Co., 85 Liberty street, New York, in catalog No 903 describes construction and application of the Fuller-Kinyon system to the transportation and distribution of pulverized coal. It includes a general description and diagrammatic sketch of the system and illustrations of the equipment and various installations.

NICKEL SILVER—Riverside Metal Co., Riverside, N. J., has prepared for distribution a booklet on nickel silver. It is designed to furnish the user of this metal sufficient data to indicate its best utilization for various requirements. Various alloys and their characteristics and purposes are explained. The material is available in sheets, wire, rods, strip, circles, blanks and bars. A similar publication has been issued on phosphor bronze, following the same plan.

SEAMLESS NIROSTA TUBING—A second edition of its booklet on seamless Nirosta KA2 tubing has been issued by the Babcock & Wilcox Tube Co., Beaver Falls, Pa. Extended use of these tubes since the first edition was published in 1929 has brought a wealth of information on this alloy, making the present edition of much greater value to prospective users. As a result much has been learned and the engineering data and operating information now available are presented in this publication. Profuse illustration gives added value.

ELECTRICAL EQUIPMENT—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is distributing a number of bulletins on various forms of equipment, including: L-20426 and L-20447, single-stage and two-stage condensate pumps, respectively; 1835-A, on 3600 revolutions-per-minute steam turbine-generator units; A-08502 on electric locomotives of three types; 1886, on dry-type transformers and autotransformers; 20439, on induction motors for power plant auxiliaries; MN-1296, on electric bell-type nitriding furnaces; 20512, on its line of circular chart recording instruments.